



Clark University
in the City of Worcester,
Massachusetts.

Register and
Seventeenth Official
Announcement.

1905.

BOARD OF TRUSTEES.

STEPHEN SALISBURY,

EDWARD COWLES,

THOMAS H. GAGE,

CHARLES H. CLARK,

ROCKWOOD HOAR,

A. GEORGE BULLOCK,

ORLANDO W. NORCROSS,

FRANCIS H. DEWEY,

ARTHUR F. ESTABROOK.

CLARK UNIVERSITY

WORCESTER, MASS.

REGISTER

AND

Seventeenth Official Announcement

WORCESTER, MASS.

PUBLISHED FOR THE UNIVERSITY.

March, 1905.

CALENDAR, 1905-1906.

1905.

| | | | |
|-------|-----|------------|------------------------------------|
| APRIL | 3. | Monday, | } Spring Recess. |
| APRIL | 8. | Saturday, | |
| APRIL | 19. | Wednesday, | Patriots' Day. |
| MAY | 30. | Tuesday, | Memorial Day. |
| JUNE | 22. | Thursday, | Sixteenth academic year closes. |

Summer Vacation of 14 Weeks.

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| SEPT. 28. | Thursday, | Seventeenth academic year begins. |
| Nov. 30. | Thursday, | Thanksgiving Day. |
| DEC. 23. | Saturday, | } Christmas Recess. |
| 1906. | | |

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|-------|-----|------------|--------------------------------------|
| JAN. | 4. | Thursday, | } Founder's Day.* |
| FEB. | 1. | Thursday, | |
| FEB. | 22. | Thursday, | Washington's Birthday. |
| APRIL | 2. | Monday, | } Spring Recess. |
| APRIL | 7. | Saturday, | |
| APRIL | 19. | Thursday, | Patriots' Day. |
| MAY | 30. | Wednesday, | Memorial Day. |
| JUNE | 21. | Thursday, | Seventeenth academic year closes. |

Summer Vacation of 14 Weeks.

* Not a holiday.

MEMBERS.

STAFF.

G. STANLEY HALL, PH. D., LL. D., 94 Woodland St.
President of the University and Professor of Psychology.

A. B., Williams College, 1867, and A. M., 1870; Ph. D., Harvard University, 1878; Lecturer in Harvard and Williams Colleges, 1880-81; Professor of Psychology, Johns Hopkins University, 1881-88; LL. D., University of Michigan, 1888, Williams College, 1889, and Johns Hopkins University, 1902. Resident Fellow of the American Academy of Arts and Sciences; Resident member of the Massachusetts Historical Society.

WILLIAM E. STORY, PH. D., 17 Hammond St.
Professor of Mathematics.

A. B., Harvard University, 1871; Ph. D., Leipzig, 1875; Parker Fellow (Harvard), 1874-5; Tutor of Mathematics, Harvard University, 1875-76; Associate, Assistant Professor, and Associate Professor of Mathematics, Johns Hopkins University, 1876-89. Member of the London Mathematical Society; Resident Fellow of the American Academy of Arts and Sciences.

EDMUND C. SANFORD, PH. D., 24 Richards St.
Professor of Experimental and Comparative Psychology.

A. B., University of California, 1883; Fellow, Johns Hopkins University, 1887; Ph. D., Johns Hopkins University, 1888; Instructor in Psychology, Johns Hopkins University, 1888; Instructor in Psychology, Clark University, 1889-92; Assistant Professor, 1892-1900.

ARTHUR G. WEBSTER, PH. D., 66 West St.
Professor of Physics.

A. B., Harvard University, 1885; Instructor in Mathematics, Harvard University, 1885-86; Parker Fellow, 1886-89; Student, Universities of Berlin, Paris, Stockholm, 1886-90; Ph. D., Berlin, 1890; Docent in Physics, Clark University, 1890-92; Assistant Professor, 1892-1900. Member National Academy of Sciences; President, American Physical Society; Resident Fellow of the American Academy of Arts and Sciences.

HENRY TABER, PH. D., 65 West St.
Professor of Mathematics.

Ph. B., Yale University, 1882; Ph. D., Johns Hopkins University, 1888; Assistant in Mathematics, Johns Hopkins University, 1888-89. Docent in Mathematics, Clark University, 1889-92; Assistant Professor, 1892-03. Member of the London Mathematical Society; Resident Fellow of the American Academy of Arts and Sciences.

CARROLL D. WRIGHT, PH. D., LL. D., 656 Main St.
Professor of Statistics and Social Economics.

President, Collegiate Department, 1902 - .

CLIFTON F. HODGE, Ph. D., 3 Charlotte St.
Assistant Professor of Physiology and Neurology.

A. B., Ripon College, 1882; Fellow in Biology, Johns Hopkins University, 1888-89; Ph. D., Johns Hopkins University, 1899; Fellow in Psychology, and Assistant in Neurology, Clark University, 1889-91; Instructor in Biology, University of Wisconsin, 1891-92.

WILLIAM H. BURNHAM, Ph. D., 100 Chatham St.
Assistant Professor of Pedagogy.

A. B., Harvard University, 1882; Instructor in Wittenberg College, 1882-83; Instructor in the State Normal School, Potsdam, N. Y., 1883-85; Fellow, Johns Hopkins University, 1885-86; Ph. D., 1888, and Instructor in Psychology, 1888-89; Docent in Pedagogy, Clark University, 1890-92; Instructor, 1892-1900.

ALEXANDER F. CHAMBERLAIN, Ph. D., 12 Shirley St.
Assistant Professor of Anthropology.

B. A. (1886), M. A. (1889), University of Toronto; Fellow in Modern Languages, University College, Toronto, 1887-90; Librarian, Canadian Institute, Toronto, 1889-90; Fellow in Anthropology, Clark University, 1890-92; Ph. D., Clark University, 1892; Lecturer in Anthropology, Clark University, 1892-1900; Acting Assistant Professor, 1900-04; Associate Editor, *American Antiquarian*; Editor, *Journal of American Folk-Lore*; Corresponding Member, O Instituto de Coimbra, Portugal. Member of the American Antiquarian Society.

JOSEPH DE PEROTT, 5 Gates St.
Lecturer in Mathematics.

Student, Universities of Paris and Berlin, 1877-80.

SAMUEL P. CAPEN, Ph. D., 87 Woodland St.
Instructor in Modern Languages.

A. B., A. M., Tufts College, 1898; A. M., Harvard, 1900; Harrison Fellow in Germanic Languages at University of Pennsylvania, 1900-1901; Graduate Student, University of Pennsylvania, on leave of absence, 1901-02; Student at University of Leipzig, 1901-02; Ph. D., University of Pennsylvania, 1902; Instructor in Modern Languages, Collegiate Department, 1902-3; Assistant Professor, 1903 -.

FREDERICK A. BUSHEE, Ph. D., 36 Kingsbury St.
Instructor in Economics.

Litt. B., Dartmouth, 1894; A. M., Harvard, 1898; Ph. D., Harvard, 1902; Resident South End House, Boston, 1894-5; 1896-7; Hartford School of Sociology, 1895-6; Harvard University, 1897-1900; Collège Libre des Sciences Sociales, Collège de France, Paris, University of Berlin, 1900-01; Assistant in Economics, Harvard University, 1901-02; Instructor in Economics and History, Collegiate Department, 1902-03; Assistant Professor, 1903 -.

BENJAMIN S. MERIGOLD, Ph. D., 59 Chatham St.
Instructor in Chemistry.

A. B., 1896; A. M., 1897; Ph. D., 1901, Harvard University; Assistant in Chemistry, Harvard, 1896-1900; Instructor in Chemistry, Worcester Polytechnic Institute, 1900-1903; Assistant Professor of Chemistry, Collegiate Department, 1903 -.

GEORGE H. BLAKESLEE, PH. D.,
Instructor in History.

7 Downing St.

A. B., Wesleyan, 1893; A. M., Harvard, 1899; Ph. D., Harvard, 1903; Student, Johns Hopkins University, 1893-94; Graduate Student, Harvard University, 1898-1901; Parker Fellow, Harvard, 1901-02; Student, Universities of Berlin, Leipzig, and Oxford, 1901-03; Instructor in History, Collegiate Department, 1903-04; Assistant Professor, 1904- .

LOUIS N. WILSON, A. B.,
Librarian of the University.

11 Shirley St.

ANNUAL APPOINTMENTS.

NON-RESIDENT LECTURER.

EDWARD COWLES, M. D., LL. D.,
Non-Resident Lecturer on Psychiatry.

Boston, Mass.

A. B., Dartmouth College, 1859; A. M., 1863; Medical House Pupil, Retreat for the Insane, Hartford, Conn.; 1860-62; M. D., Dartmouth Medical School, 1863; M. D., College of Physicians, and Surgeons, New York, 1863; Medical Corps, United States Army, 1863-72; Resident Physician and Superintendent, Boston City Hospital, 1872-79; Medical Superintendent, McLean Hospital, Waverley, Mass., 1879-1903. Lecturer on Mental Diseases, Dartmouth Medical School, 1885-86; Professor of Mental Diseases, *ibid.*, 1886-; Fellow by Courtesy, Johns Hopkins University, 1887-88; Clinical Instructor in Mental Diseases, Harvard Medical School, 1888-; LL. D., Dartmouth College, 1890.

DOCENTS.

JEAN DU BUY, J. U. D., PH. D.,
Docent in Comparative Religion.

45 Hollywood St.

Student University of Berlin, 1884-87; 1889-90; J. U. D. (*Cum laude*), University of Heidelberg, 1889; Graduate Student in Political Science and Philosophy, Yale University, 1892-94; Ph. D., *ibid.*, 1894; Special Student, Yale Divinity School, 1894-95; Special Lecturer on Comparative Religion, Meadville Theological School, spring 1901; Honorary Fellow in Comparative Religion, Cornell University, 1901-02; Honorary Fellow in Psychology of Religion, Clark University, 1902-03; Docent in Comparative Religion, 1903-04.

JOHN WILLIS SLAUGHTER, PH. D., Camp Hill, Ala.,
Docent in Æsthetics.

51 Wellington St.

A. B., B. D., Lombard College, 1898; Ph. D., Univ. of Michigan, 1901; Assistant in Psychology, University of Michigan, 1899-1901; Honorary Fellow, Clark University, 1901-1902. Docent in Æsthetics and the Philosophy of Evolution, 1902-03; Instructor in Psychology, University of Cincinnati, 1903-04.

LECTURERS.

LOUIS WILLIAM FLACCUS, PH. D., Ben Avon, Pa.,
Honorary Fellow in Ethics. 46 May St.

A. B., Washington and Jefferson College, Pa., 1900; Student in Philosophy, University of Berlin, Winter semester, 1900-01; Harvard University, 1901-04; A. M., 1902; Ph. D., 1904 (Ethics).

FRED KUHLMANN, PH. D., Grand Island, Neb.,
41 Hollywood St.
Honorary Fellow in Psychology, and Assistant to Dr. Sanford.

Reader in Psychology, University of Nebraska, 1898-99; A. B., *ibid.*, 1899; A. M., 1901; Scholar in Philosophy and Assistant in Psychological Laboratories, 1899-1900; Fellow in Philosophy and Assistant in Psychological Laboratories, 1900-01; Fellow in Psychology, Clark University, 1901-02; Fellow and Assistant, 1902-03; Ph. D., Clark University, 1903; Honorary Fellow, and Assistant to Dr. Sanford, 1903-04.

JOSIAH MOSES, A. M., Richmond, Va., 393 Pleasant St.
Honorary Fellow and Assistant in Psychology.

A. B., Richmond College, 1899; A. M., 1900; Scholar in Psychology, Clark University, 1900-01; Fellow, 1901-04.

GEORGE E. PARTRIDGE, PH. D., Worcester, Mass.,
Lecturer in Psychology. 54 Hollywood St.

Special Student in Philosophy, Clark University, 1895-96; Scholar, 1896-98; Honorary Fellow, 1899-1900; Ph. D., Clark University, 1899; Professor of Psychology, State Normal School, Mankato, Minn., 1900-1904.

MILLETT TAYLOR THOMPSON, PH. D., Providence, R. I.
Honorary Fellow in Morphology. 23 Maywood St.

A. B., Brown University, 1898; Ph. D., 1902; Fellow in Biology, Clark University, 1902-03; Honorary Fellow, 1903-04; Instructor in Zoölogy, Collegiate Department, Clark University, 1902-.

HONORARY FELLOWS.

FRANK K. BAILEY, B. S., 6 Downing St.
Honorary Fellow in Physics.

B. S., Colorado College, 1898; Scholar in Physics, Clark University, 1898-99; Fellow, 1899-1901; Assistant, Allegheny Observatory, 1901-04.

RUFUS C. BENTLEY, A. M., 7 Downing St.
Honorary Fellow in Pedagogy.

A. B., 1894, A. M., 1896, University of Nebraska; Assistant in Psychology, University of Nebraska, 1893-96; Fellow in Education, Teachers College, Columbia University, 1900-01; Fellow in Pedagogy, Clark University, 1901-03; Honorary Fellow, 1903-04; Professor of Latin and Dean of the Faculty, Collegiate Department, Clark University, 1902-03; Professor of Pedagogy and Dean of the Faculty, 1903.

JOSEPH G. COFFIN, B. S., Boston, Mass., 70 Florence St.
Honorary Fellow in Physics.

Student, Collège Chaptal, Paris, 1892-94; B. S., Massachusetts Institute of Technology, 1898; Assistant to Prof. Cross, Massachusetts Institute of Technology, 1898-1900; Scholar in Physics, Clark University, 1900-01; Fellow and Assistant, 1901-02; Fellow, 1902-03; Honorary Fellow, 1903-04; Instructor in Physics, Collegiate Department, Clark University, 1902- .

EDWARD CONRADI, PH. D., New Bremen, O., 35 Clifton St.
Honorary Fellow in Psychology.

A. B., Indiana University, 1897; A. M., 1898; Fellow in Psychology, Clark University, 1902-04; Ph. D., Clark University, 1904.

CHARLES WILSON EASLEY, A. M., Worcester, Mass.,
Honorary Fellow in Physics. 87 Woodland St.

A. B., Dickinson College, 1897; A. M., 1899; Scholar in Physics, Clark University, 1901-02; Fellow, 1902-03; Honorary Fellow, 1903-04; Instructor in Chemistry, Collegiate Department, Clark University, 1902- .

S. B. HASLETT, PH. D., Worcester, Mass., 4 Crown St.
Honorary Fellow in Psychology.

Graduate of the Edinboro (Pa.) State Normal School, 1883; A. B., Grove City College, Pa., 1889; A. M., 1896; Graduate, Allegheny Theological Seminary, 1892; Scholar in Psychology, Clark University, 1898-1900; Fellow, 1900-01; Ph. D., Clark University, 1901; Professor of Psychology and Education, Bible Normal College, Hartford, Conn., and Lecturer in Hartford Theological Seminary, 1901-02; Honorary Fellow in Psychology, Clark University, 1902-04.

FREDERICK H. HODGE, A. M., Worcester, Mass.,
Honorary Fellow in Mathematics. 919 Main St.

A. B., Boston University, 1894; A. M., 1899; Special Student, Mass. Normal School, Bridgewater, 1894-95; Professor of Mathematics, John B. Stetson University, 1895-96; Graduate Student in Mathematics, University of Chicago, 1896-97; Scholar in Mathematics, Clark University, 1897-98; Fellow, 1898-99; 1901-03; Honorary Fellow, 1903-04; Professor of Mathematics and History, Bethel College, 1899-1901; Instructor in Mathematics, Collegiate Department, Clark University, 1902- .

FRED MUTCHLER, A. B., Terre Haute, Ind., 44 May St.
Honorary Fellow in Biology.

A. B., Indiana University, 1902; Scholar in Biology, Clark University 1902-03; Fellow, 1903-04; Instructor in Botany, Collegiate Department Clark University, 1902-03; Professor of Biology, Conn. State Agricultural College, 1904- .

JAMES P. PORTER, A. M., Worcester, Mass. 938 Main St.
Honorary Fellow in Psychology.

A. B., Indiana University, 1898; A. M., 1901; Student, Indiana State Normal School, 1890-91; 1892-93; Instructor in Psychology, Indiana University, 1900-03; In charge of work in Neurology, Indiana University Biological Station, 1901 and 1903; Honorary Fellow in Psychology, Clark University, 1903-04; Instructor in Psychology, Collegiate Department, Clark University, 1903- .

JONATHAN RIGDON, A. B., 41 Florence St.
Honorary Fellow in Psychology.

A. B., Central Normal College, Ind., 1885; A. B., Boston University, 1891; Instructor in Psychology and Philosophy, Central Normal College, 1885-1903; President, *ibid.*, 1902-1903. Instructor in the History of Philosophy and Ethics, Clark College, 1905.

THEODATE L. SMITH, PH. D., 11 Tirrell St.
Assistant to Dr. Hall in research work under Estabrook Grant.

A. B., Smith College, 1882; A. M., 1884; Yale University, 1893-95; Special Student, Clark University, 1895-96; Ph. D., Yale, 1896; Cornell University 1900; Assistant to President Hall in research work under Carnegie Grant, Clark University, 1902-04.

MYRON W. STICKNEY, A. M., Worcester, Mass.,
Honorary Fellow in Biology. 28 Freeland St.

A. B., Bates College, 1893; A. M., Brown University, 1895; Graduate Student, Brown University, 1896-97; Fellow in Biology, Clark University, 1900-01; Honorary Fellow, 1903-04; Instructor in Science, English High School, Worcester, 1901- .

SAMUEL WEIR, PH. D., Yorkville, Ill., 70 Mason St.
Honorary Fellow in Philosophy.

A. B., Northwestern University, 1889; B. D., Garrett Biblical Institute, 1887; A. M., Illinois Wesleyan University, 1891; Ph. D., University of Jena, 1895; Professor of Greek and Latin, Southwest Kansas College, 1889-1890; Instructor in Mathematics, Northwestern University, College of Liberal Arts, 1892-93; Graduate Student in Philosophy, Boston University, Sept.-Apr., 1893-94; Graduate Student in Leipsic and Jena, April 1894-August, 1895; Professor of History of Education and of Ethics, New York University, 1895-1901; Lecturer on Pedagogy, University of Cincinnati, 1901-02; President, State Normal School, Clarion, Pa., 1902-04.

FELLOWS AND SCHOLARS.

REGINALD BRYANT ALLEN, M. S., Medford, N. J.,
Fellow in Mathematics, 7 Downing St.

B. S., Rutgers College, 1893; M. S., 1897; Acting Professor of Mathematics, Massachusetts Agricultural College, 1895; Instructor and Assistant Professor of Mathematics, Adelphi College, Brooklyn, N. Y., 1897-1901; Scholar, Clark University, 1901-1902; Fellow, 1902-03.

WILLIAM FREDERICK BOOK, A. B., Princeton, Ind.,
Fellow in Psychology. 29 May St.

A. B., Indiana University, 1900; Fellow in Psychology, Clark University, 1903-04.

ALVIN BORGQUIST, B. S., 919 Main St.
Fellow in Psychology.

B. S., University of Utah, and Graduate, State Normal School, Utah, 1897; Graduate Student, Leland Stanford, Jr., University, Jan., 1898-May, 1903; Graduate Student, University of California, 1903-04.

- ALFRED A. CLEVELAND, A. M., Astoria, Oregon,
Fellow in Pedagogy. 24 Beaver St.
A. B., University of Oregon, 1898; A. M., 1903; Fellow in Pedagogy, Clark University, 1903-04.
- ORIS P. DELLINGER, A. B., Bicknell, Ind., 940 Main St.
Fellow in Biology.
Graduate, Indiana State Normal School, 1900; Student, University of Chicago, 1900-01; Assistant in Biology, Indiana State Normal School, 1901-03; A. B., Indiana University, 1904.
- CLAUDE W. EDGERTON, B. Sc., Woodbine, Iowa,
Fellow in Biology. 44 May St.
B. Sc., University of Nebraska, 1903; Student Assistant, Bureau of Forestry, 1903-04.
- ARNOLD LUCIUS GESELL, Ph. B., Alma, Wis., 6 Wyman St.
Fellow in Pedagogy.
Graduate, Stevens Point (Wis.) Normal School, 1899; University of Wisconsin, 1901-03; Ph. B., *ibid.*, 1903.
- DAVID GIBBS, S. B., Idell, N. J., 4 Charlotte St.
Fellow in Pedagogy.
Graduate, State Normal School, Trenton, N. J., 1892; S. B., Harvard University, 1898; Graduate Student, *ibid.*, 1898-99; Division Superintendent of Public Instruction, Philippine Islands, 1900-02; Fellow in Pedagogy, Clark University, 1902-3.
- B. S. GOWEN, M. A., Winchester, Tenn., 5 Hollywood St.
Fellow in Psychology.
Graduate, Winchester Normal College, 1886; Teacher in Mathematics, Scottsboro (Ala.) College and Normal School, 1889-93; Teacher in Mathematics, Mary Sharp College, Winchester, Tenn., 1893-95; B. A., Yale University, 1901; M. A., 1902; Eldridge Fellow in Philosophy, *ibid.*, 1902-04.
- ROWLAND HAYNES, A. B., Townsend, Mass.,
Fellow in Psychology of Religion. 49 Maywood St.
A. B., Williams College, 1902; Student, Columbia University, 1902-04 (Teachers College, 1903-04); Student, Union Theological Seminary, 1902-1904.
- JAMES RALPH JEWELL, A. B., Moran, Kansas,
Fellow in Psychology. 70 Florence St.
A. B., Coe College, 1903; Assistant in Psychology, Coe College, 1902-03; Fellow in Psychology, Clark University, 1903-04.
- DAVID KELLY, M. A., Seattle, Wash., 17 Oread Place
Fellow in Physics.
B. S., University of Washington, 1899; M. A., 1901; Tutor in Physics, University of Washington, 1899-1901; Assistant Professor of Physics, 1901-03; Scholar in Physics, Clark University, 1903-04.
- TOSHI-YASU KUMA, A. B., Tokyo, Japan, 87 Woodland St.
Fellow in Psychology.
A. B., Stanford University, 1903; Fellow in Psychology, Clark University, 1903-04.

WALTER LIBBY, M. A., Humberstone, Canada, 1018 Main St.
Fellow in Psychology.

B. A., Victoria University, 1887; English Specialist, Ottawa Collegiate Institute, 1891-94; Student of Medicine, University of Toronto, 1894-96; English Specialist, Stratford Collegiate Institute, 1897-1901; Fellow in Psychology, Clark University, Nov., 1901-April, 1902; Student, Universities of Leipsic, Berlin, Paris, and Munich, and College of France, 1902-04; M. A., University of Toronto, 1902.

T. S. LOWDEN, PH. D., Greencastle, Ind., 42 Richards St.
Fellow in Psychology.

Student, Glasgow (Ky.) Normal School, 1887-89; Instructor in English, *ibid.*, 1888-89; A. B., Thiel College, 1893; A. M., and Ph. D., University of Wooster, 1893; Dean of Eastern Indiana Normal School and Professor of Philosophy and Education, 1899-1901; Professor of Pedagogy and Principal of the Academy, De Pauw University, 1901-04.

C. ALLAN LYFORD, B. S., Worcester, Mass., 676 Pleasant St.
Fellow in Biology.

B. S., Worcester Polytechnic Institute, 1903; Fellow in Biology, Clark University, 1903-04; Assistant in Biology and Chemistry, Collegiate Department, Clark University, 1904.

WILLIAM ORVILLE MENDENHALL, A. M., Wilmington, O.,
Fellow in Mathematics. 23 Maywood St.

A. B., Penn College, Iowa, 1900; A. M., 1901; A. B., Haverford College, 1901; Professor of Mathematics, Wilmington College, 1902.

GEORGE EDMUND MYERS, A. M., Colorado Springs, Col.,
Fellow in Pedagogy. 974 Main St.

A. B., Ottawa University, Ottawa, Kansas, 1896; Student in Mathematics University of Chicago, 1899-1901; A. M., *ibid.*, 1901.

CHARLES EDGAR REBER, PH. D., Shippensburg, Pa.,
Fellow in Psychology. 87 Woodland St.

A. B., Ursinus College, 1893; A. M., 1895; Ph. D., Wooster University, 1897; Graduate Student in English, Harvard, 1897-98; Graduate Student in Pedagogy, Psychology and English, University of Pennsylvania, 1898-1901; Instructor, State Normal School, Slippery Rock, Pa., 1895-97; Professor, Ursinus College, 1898-99; Head of Dept. of Pedagogy and Psychology, Angola, Ind., Normal College, 1901-03; Instructor in Psychology, State Normal School, Shippensburg, Pa., 1903-04.

JAMES T. ROOD, B. S., Worcester, Mass., 30 John St.
Fellow in Physics.

B. S., Worcester Polytechnic Institute, 1898; Scholar in Physics, Clark University, 1903-04.

ANNA A. SCHRYVER, A. B., Ann Arbor, Mich.,
Fellow in Biology. 87 Woodland St.

Teacher, Horace Mann School, New York City, 1891-92; Instructor in Science Department Teachers College, 1892-94; Assistant Professor *ibid.*, 1894-95; In charge of Botany, Michigan State Normal College, 1895-1900; Lecturer in Botany, Geology and Nature Study, Chautauqua College, Chautauqua, N. Y., 1894-1900; A. B., University of Michigan, 1903; Student in Psychology and Pedagogy, Clark University, 1903-04.

LEWIS MADISON TERMAN, A. M., Franklin, Ind.,
Fellow in Psychology. 32 Clifton St.

Graduate, Central Normal College, Danville, Ind., 1898; A. B., Indiana University, 1903; A. M., 1903; Fellow in Psychology, Clark University 1903-04.

OLIVER SCOTT THOMPSON, A. B., Waukegan, Ill.,
Fellow in Psychology. Leominster, Mass.

A. B., Lake Forest University, 1904.

CHARLES W. WADDLE, M. A., Colorado Springs, Colo.,
Fellow in Psychology. 80 Woodland St.

A. B., Colorado College, 1901; M. A., 1903; Special Student in Psychology, *ibid.*, 1903-04.

LLOYD A. H. WARREN, M. A., Balderson, Canada,
Fellow in Mathematics. 18 Gates St.

M. A., Queen's University, Kingston, Canada, 1902; Tutor in Mathematics, 1902-04.

HORACE L. BRITTAIN, M. A., Woodstock, N. B.
Scholar in Psychology. 70 Florence St.

B. A., University of New Brunswick, 1895; M. A., 1898; Principal, Horton Collegiate Academy, 1898-1904.

MAURICE WALTER MEYERHARDT, Worcester, Mass.,
Scholar in Psychology. 34 Prescott St.

Student at Koellnisches Gymnasium, Berlin, seven years; Instructor in German and Latin, Pernot School of Languages, Worcester, 1900-03; Special Student in Psychology, Clark University, 1903-04.

N. L. NELSON, B. Pd., Provo City, Utah,
Scholar in Psychology. 4 Grand St.

Graduate, Normal Course, Brigham Young University, 1883; Professor of English, *ibid.*, 1883- ; B. Pd., *ibid.*, 1893.

HAROLD H. PHILLIPS, Beemerville, N. J.,
Scholar in Psychology. 9 Grand St.

Graduate, State Normal School, Trenton, N. J., 1901; Student, School of Pedagogy, New York University, 1901-03; Special Student in Psychology and Pedagogy, Clark University, 1903-04.

GEORGE E. STEBBINS, A. B., Shelburne Falls, Mass.,
Scholar in Physics. 27 Downing St.

A. B., Bates College, 1903; Assistant in Physics, Bates College, 1903-04.

WILLIAM E. STORY, JR., A. B., Worcester, Mass.,
Scholar in Physics. 17 Hammond St.

A. B., Harvard University, 1904.

SPECIAL STUDENTS.

- JOHN M. BEMIS, M. D., 223 Salisbury St.
Student in Psychiatry.
M. D., University of Vermont, 1893.
- ROBERT JOHN FLOODY, S. T. B., Worcester, Mass.,
Student in Philosophy. 43 Endicott St.
Graduate, Teachers Training School, Ont., Can., 1882; B. S., Albion College, 1890; M. S., 1894; S. T. B., Boston University, 1894.
- MCLEOD HARVEY, A. B., 5 Oread Place
Student in Philosophy.
A. B., Dalhousie College, Halifax, Nova Scotia, 1889; Graduate in Theology, Presbyterian College, Halifax, 1891; Student in Philosophy, Clark University, 1902-04.
- ALBERT WELLMAN HITCHCOCK, B. D., 8 Institute Rd.
Student in Philosophy.
A. B., Amherst College, 1882; A. M., 1885; B. D., Yale, 1889; Hooker Fellow, Yale, 1889-90; Yale Fellow, Berlin and Oxford Universities, 1890-91; Student in Philosophy, Clark University, 1902-04.
- CAROLINE A. OSBORNE, M. D., Worcester, Mass.,
Student in Biology. 87 Woodland St.
M. D., Women's Medical College of Pennsylvania, 1899; Superintendent Nurses, Memorial Hospital, Worcester, Mass., 1899-1904; Instructor of Nurses, *ibid.*, 1904-; Student in Biology, Clark University, 1901-04.
- NATHANIEL M. PRATT, B. D., Monson, Mass.,
Student in Philosophy.
A. B., University of Vermont, 1893; B. D., Union Theological Seminary 1896.
- MARY L. READ, Peoria, Ill., 28 Sever St.
Student in Psychology.
Student, University of Chicago, 1900-02; 1903-04.
- W. F. ROBIE, M. D., Baldwinville, Mass.,
Student in Psychology and Biology.
A. B., Dartmouth College, 1889; M. D., Dartmouth Medical School, 1893; Assistant Physician, Hospital Cottages, 1892-94; Supt. Riverview Sanitarium, 1902-.
- H. LOUIS STICK, M. D. Worcester, Mass.,
Student in Psychiatry.
M. D., College of Physicians and Surgeons, Baltimore, Md., 1900; resident Physician, Baltimore City Hospital, June 1900-Nov. 1901; Interne, Criminal Insane Asylum, Bridgewater, Mass., Nov., 1901-Feb., 1903; Assistant Resident Physician, Worcester Insane Asylum, Feb., 1903-.
- INMAN L. WILLCOX, A. M., 138 Elm St.
Student in Philosophy.
A. B., Hamilton College, 1886; A. M., Harvard University, 1900; Student, Andover Theological Seminary, 1886-1889; Scholar in Psychology, Clark University, 1901-02; Student, 1902-04.

UNDERGRADUATES ATTENDING ONE OR MORE
UNIVERSITY COURSES.

| | |
|--------------------------|--------------------|
| ROBERT I. BRAMHALL, | Worcester, Mass. |
| WILLIAM J. CHISHOLM, | Revere, Mass. |
| FREDERICK N. COOKE, JR., | Worcester, Mass. |
| ROY M. CUSHMAN, | Worcester, Mass. |
| CHARLES N. DISNEY, | Worcester, Mass. |
| ARTHUR H. ESTABROOK, | Leicester, Mass. |
| GEORGE EDWARD GAGE, | Springfield, Mass. |
| WILLIAM HAROLD KEITH, | Worcester, Mass. |
| HENRY C. MARBLE, | Worcester, Mass. |
| ALLAN B. MILLER, | Worcester, Mass. |
| HERMON LESTER SLOBIN, | Worcester, Mass. |
| HOWARD M. SMITH, | Worcester, Mass. |
| REGINALD L. WEBB, | Swampscott, Mass. |
| HAROLD C. WINGATE, | Amesbury, Mass. |

ATTENDANTS UPON SATURDAY COURSES.

| | |
|----------------------|--------------------|
| R. MOWRY BELL, | Worcester, Mass. |
| ANNA L. CALLAHAN, | Worcester, Mass. |
| MARY J. CALLAHAN, | Worcester, Mass. |
| FRANK DREW, | Worcester, Mass. |
| JOHN M. GALLAGHER, | Worcester, Mass. |
| EDITH GOODELL, | Worcester, Mass. |
| WILLIAM W. HASTINGS, | Springfield, Mass. |
| GERTRUDE McDERMOTT, | Worcester, Mass. |
| FRANK H. ROBSON, | Worcester, Mass. |
| SARAH V. SKERRETT, | Worcester, Mass. |
| STEPHEN P. STREETER, | Worcester, Mass. |

FLORENCE CHANDLER,
Clerk of the University.

52 Woodland St.

ADMINISTRATION.

The trustees are the ultimate source of authority in all matters pertaining to the University. They act collectively through the committees named below, and also through the president of the University.

BOARD OF TRUSTEES.

| | |
|----------------------|----------------------|
| STEPHEN SALISBURY, | ROCKWOOD HOAR, |
| EDWARD COWLES, | A. GEORGE BULLOCK, |
| THOMAS H. GAGE, | ORLANDO W. NORCROSS, |
| CHARLES H. CLARK, | FRANCIS H. DEWEY, |
| ARTHUR F. ESTABROOK. | |

OFFICERS.

| | |
|------------------------------|--------------------|
| Acting President, | STEPHEN SALISBURY, |
| Treasurer, - - | THOMAS H. GAGE, |
| Secretary, - - | G. STANLEY HALL. |

COMMITTEES.

Finance.

| | |
|--------------------|-----------------|
| STEPHEN SALISBURY, | THOMAS H. GAGE, |
| A. GEORGE BULLOCK. | |

Buildings.

| | |
|-----------------|----------------------|
| THOMAS H. GAGE, | ORLANDO W. NORCROSS. |
|-----------------|----------------------|

By-Laws.

STEPHEN SALISBURY.

DUTIES OF THE PRESIDENT OF THE UNIVERSITY.

The duties of this office were defined by the Trustees, May 23, 1899, as follows :

The President of the University shall consult frequently with the Trustees on all matters which concern the welfare of the University, and attend the meetings of the Board. He shall confer with each instructor concerning the development of his department, determine the duties and authority of each, and preside at the meetings of the Faculty. He shall be the authorized medium of communication between the Board of Trustees and the officers of instruction, individually and collectively, in all matters involving the administration of the University. The enactments of the Board concerning instructors and their work, and all requests, complaints and proposals from the Faculty to the Trustees shall be made known through him. He shall exercise or provide such superintendence over buildings, apparatus, books and other property, as will secure their protection and appropriate use. Expenditures must not be ordered by any instructor of the University without his previous consent or the express authority of the Board.

These duties were more fully defined by By-Laws enacted by the Corporation Sept. 26, 1889. These are as follows :

BY-LAWS.

1. The President of the University shall preside on all public academic occasions, shall direct the official correspondence, study the wants and interests of the whole University and exercise a general superintendence

over all its concerns. His first care, and that of the authorities of the University, shall be the departments already established, and next those closely related to them; but no other department shall be established until those already introduced have been brought to the highest state of efficiency then possible. All acts, however, which shall involve the expenditure of money in the administration of the University's affairs, shall be subject to the approval of the Board of Trustees or the Finance Committee for the time being.

2. As the efficiency of a University depends chiefly upon the quality of its Faculty, the Board of Trustees will hold the President to a strict but reasonable accountability for the fidelity and ability of each instructor. The President only shall have the power to select and appoint all officers of instruction, subject to the approval of the Board of Trustees. To make wise and well considered appointments, to maintain harmony within the Faculty and to increase their efficiency in research and instruction shall be his most important duty. If at any time the President shall be negligent in the discharge of these or other duties, or is from any cause disabled from discharging them, they may be exercised by the Board of Trustees.

3. The President of the University shall be the medium of communication between the Trustees and Instructors, individually and collectively, upon all matters within the field of action of either body. He shall attend all meetings of the Board of Trustees, of which he shall be notified, and shall participate in their deliberations, but without the power to vote. All complaints and requests from members of one body to the other shall be made through him.

4. The President shall call and preside over all official meetings of the Instructors, and a record of their proceedings shall be kept. These records are in no case to be made known to others than the Trustees. They shall always be in the custody of the President, but may be inspected by the Trustees, or either of them at any time.

5. The President of the University, in the absence of the Trustees or Finance Committee, shall have the entire direction and control of the persons employed about the University and not engaged in the work of instruction; the duties of all such persons shall be assigned and they shall be appointed or removed by him, subject to the approval of the Finance Committee.

6. No instructor shall order any books or apparatus, or anything connected with the work of instruction (beyond his appropriation), without the approval of the President. No expense for the care of buildings or grounds, nor for alterations or repairs within and upon the same shall be made without the approval of the Board of Trustees or the Finance Committee, such alterations or repairs in no case to exceed the appropriations made for that purpose. If the Trustees, or Finance Committee, or any person shall make contracts in behalf of the University without authority, the officer or person making such contract shall become individually responsible therefor.

7. The officers of instruction shall be appointed for a term of from one to five years. At the end of this period the work of each Instructor will be subjected to a careful scrutiny upon the results of which his reappointment shall depend, always provided, however, that any Instructor will be liable to be discharged at any

time for incapacity, neglect of duty, or for such other cause as shall seem good to the Trustees.

8. Each Instructor shall give stated lectures to however few. He shall actively and zealously strive to maintain the highest possible standard, shall work in a spirit of hearty sympathy and co-operation, and shall encourage research by precept, and if possible, by example.

9. The foregoing By-Laws are intended to embody the provisions contained in a vote passed by the corporation on the twenty-third day of May, A. D. 1889, upon the motion of Judge Devens. (See above.) If at any time hereafter any discrepancy shall be found to exist between the two, said By-Laws shall be so far modified as to conform to the provisions of said vote.

10. No instructor shall engage in any outside professional or technical pursuit without the approval of the Board, the Finance Committee, or the President.

11. These By-Laws, or any one of them, may be changed, amended, or repealed by a vote of three-fourths at least of the Trustees at any meeting of their Board duly called, notified, and held for that purpose.

GENERAL STATEMENTS.

The University now consists of a group of ten closely related departments, in which all its work and that of Instructors, Fellows and Scholars is grouped. These departments are as follows :

- I. MATHEMATICS.
- II. PHYSICS.
- III. CHEMISTRY.
- IV. BIOLOGY.
- V. ANTHROPOLOGY.
- VI. PSYCHOLOGY.
- VII. EDUCATION.
- VIII. ECONOMICS AND SOCIOLOGY.
- IX. HISTORY.
- X. MODERN LANGUAGES.

THE FACULTY.

The Faculty elect Fellows and take action upon general requirements for the Doctor's degree and other promotions, act and advise upon whatever may be officially submitted to them by the Board or by the President, and consider all matters not otherwise provided for, and in which all departments of the University are alike interested.

ADMISSION.

Only graduate students or those of equivalent attainments are admitted to full membership in the University, except in rare and special cases. At present no entrance examinations are required; but by testimonials, diplomas, personal interviews, or written specimens of work, the authorities must be satisfied that the applicants have scholarship enough to work to advantage, and zeal and ability enough to devote themselves to their chosen field. The methods of the University are too costly, and its energy and funds too precious, to be spent upon those who are not well trained, promising, and in earnest.

It is highly desirable that candidates entering any of the ten departments shall have, besides a knowledge of the other subjects commonly taught in colleges, a reading knowledge of French and German.

For the select students who are received, it is the purpose of the University to open all its privileges and to supply every incentive possible in the way of books, facilities, and, above all, direct personal stimulus. The chief, as well as the best, work of this University is individual and involves daily suggestion, encouragement and direction. The limited number of students per-

mits more or less personal instruction in each case.

CLASSES OF APPOINTEES.

No clearly marked line exists between students and instructors. Fellows who have attained some degree of mastery in a special line of work sometimes give brief special courses, which may be attended by professors. This is a stimulus to the student, and both tests and exhibits power in teaching.

I. DOCENTS.

The highest annual appointment not involving membership in its Faculty is that of Docent. These positions are primarily honors, and are reserved for the few whose work has already marked a distinct advance beyond the Doctorate and who wish to engage in research. They are not assistants, and their relations are directly with the President of the University.

Docents may be provided with individual rooms, and special apparatus may be purchased for their work if desired and approved. While they will be expected to deliver a limited number of lectures on some special chapter of their department, their time will be mainly reserved for study and research in a way best adapted to qual-

ify them still more fully for academic advancement.

These positions are official appointments made by the Faculty upon nomination of the head of the department and on the following conditions:

1. The candidate must have received the degree of Ph. D. at least one year before he can enter upon the duties of Docentship.

2. That year must have been spent in research and the candidate must have given evidence of his skill and capacity as a teacher by giving a course of lectures, by assisting in the regular work of instruction in this or some other institution of university rank, or in some other satisfactory manner.

3. The candidate must prepare and read in public an habilitation address approved as such by the chief instructor in his department.

4. If these conditions are fulfilled he will receive at the close of his address a diploma granting him the *venia docendi* for the following year in this University and formally attesting his fitness as both scholar and teacher for an academic chair.

5. The fee for this diploma shall be \$25, which in case of need the Faculty shall have power to remit.

A memoir or essay representing original work

in the department, but no examination, is required. This highest formal academic honor will be strictly reserved for those of marked scientific attainment and teaching ability and, so far as this diploma can have the significance of a title or degree, it will be regarded by the University as a brevet collegiate professorship.

It is believed that the difficulties under which college trustees sometimes succumb in selecting suitable professors may be diminished by the existence of such a select body of scholars of guaranteed scientific training, ability, and approved power to teach, and that otherwise this new grade will aid in raising the standard of academic scholarship in colleges and in encouraging scientific research here. Appointees of this class may be paid a small salary.

II. LECTURERS.

Those who have already taken the degree of Doctor of Philosophy or who are under appointment as Fellows may, on recommendation of the head of the department, be designated to give a number of lectures upon topics in which they have attained special competency.

III. DOCTORS OF PHILOSOPHY.

Those who have already advanced to the Doc-

tors's degree may be appointed Honorary Fellows and given the privileges of the University, including those of the Library. In past years many who have already taken this degree, either in this country and abroad, and who are awaiting academic appointment, have found these positions both helpful for their own further research and development and also advantageous for attaining the collegiate and university appointments that they seek.

IV. CANDIDATES FOR THE DEGREE OF DOCTOR OF PHILOSOPHY.

At least one, but in most cases three, years of graduate work are necessary for this degree. Examinations for it, however, may be taken at any time during the academic year when, in the judgment of the University authorities, the candidate is prepared, provided the requirement of one year's residence has been absolved.

For this degree one requirement is a dissertation upon an approved subject, to which it must be an original contribution of value. To this capital importance is attached. It must be reported on in writing by the chief instructor before the examination, printed at the expense of the candidate, and at least one hundred copies given to the University. In case, however, of a disser-

tation of unusual length, or containing expensive plates, the Faculty shall have power, at the request of the candidate, to reduce this number of presentation copies to fifty.

Such formal or informal tests as the Faculty may determine shall mark the acceptance of each student or Fellow as a candidate for this degree. One object of this preliminary test shall be to insure a good reading knowledge of French and German. Such formal candidature shall precede the examination itself by a period prescribed in the special rules below.

The fee for the Doctor's degree is \$25, payable before the examination. The presentation copies of the dissertation must be in the hands of the Librarian before the diploma is delivered. In exceptional cases, and by special action of the Faculty, the act of promotion may precede the presentation of the printed copies of the dissertation.

An oral, but no written, examination is required upon at least one minor subject in addition to the major before an examination jury composed of at least four members, including the head of the department and the President of the University, who is authorized to invite any person from within or without the University to be present and to ask questions. The jury

shall report the results of the examination to the Faculty, who will recommend satisfactory candidates for the degree.

For the bestowal of this degree, the approbation of the Board of Trustees must in each case be obtained by their signature upon the diploma. They desire that the standard of requirements for it be kept the highest practicable, that it be reserved for those of superior ability and attainment only, and that its value be never suffered to depreciate.

It is to the needs of candidates for this degree that the lectures, seminaries, laboratories, collections of books, apparatus, etc., are especially shaped, and no pains will be spared to afford them every needed stimulus and opportunity. It is for them that the Fellowships and Scholarships are primarily intended, although any of these honors may be awarded to others.

On November 14th, 1900, the following vote was passed by the Board of Trustees :

That the University will admit candidates for the degree of Doctor of Philosophy, and will confer that degree, without regard to the distinction of sex.

SPECIAL RULES CONCERNING THE DOCTOR'S DEGREE.

I. *Residence.* No candidate shall receive the

degree of Doctor of Philosophy without at least one academic year's previous residence.

II. *Candidature for the Doctor's Degree.* Every applicant for the Doctor's Degree shall fill out, before October fifteenth, the regular application blank provided at the office. This schedule shall be submitted to the head of the department and the instructor in the major subject. Before affixing their signatures they shall satisfy themselves, in such manner as they may desire, as to the fitness of the applicant.

III. When countersigned, this schedule shall be filed with the President, and the applicant will be examined in French and German by the annual Committee for that purpose.

IV. In case of a favorable report by this committee, the applicant shall be a regular candidate for the degree.

V. Candidates complying with all preliminary conditions, including the examinations in French and German, before November first will be allowed to proceed to the doctor's examination at any time between May fifteenth following and the end of the academic year.

VI. *The Doctor's Dissertation.* The dissertation must be presented to the instructor under whose direction it is written, and reported upon by him before the doctor's examination. In every

case the dissertation shall be laid before the jury of examination, at the time of examination, in form suitable for publication. This provision shall not, however, preclude the making of such minor changes later as the chief instructor may approve.

VII. The dissertation shall be printed at the expense of the candidate and the required copies deposited with the Librarian within one calendar year after the first of October following the examination. The candidate alone will be held responsible for the fulfilment of these conditions.

VIII. The favorable report of the chief instructor, filed in writing with the Clerk of the University, shall be a sufficient imprimatur or authorization for printing as a dissertation. The printed copies shall bear upon the cover and title page the statement of approval in the following words, over the signature of the chief instructor :

A Dissertation submitted to the Faculty of Clark University, Worcester, Mass., in partial fulfilment of the requirements for the degree of Doctor of Philosophy, and accepted on the recommendation of

(NAME OF CHIEF INSTRUCTOR.)

IX. *Examinations for the Doctor's Degree.* The examinations for the doctor's degree may be held at any time during the academic year, provided that at least one academic year has elapsed since the completion of the preliminaries

of candidature, except in the case of fulfilment of these conditions between the beginning of any academic year and November first of that year, to which case Rule V applies. The examinations shall be held at such hours and places as the President may appoint.

X. Examinations may also be held during the regular vacations of the University, but for these an additional fee of five dollars to each examiner and the reasonable travelling expenses of any examiners who are out of town, all payable in advance, will be required.

V. SPECIAL STUDENTS NOT CANDIDATES FOR A DEGREE.

Any one desiring to undertake a special and approved line of research, and whose attainments are such as to satisfy the requirements of the University, may also be received. This class includes persons who may desire to devote themselves exclusively to one or more of the special branches—mathematics, physics, chemistry, biology, anthropology, psychology, education, economics and sociology, history, or modern languages,—but who do not care to matriculate or become candidates for a degree.

These students, provided they satisfy the heads of the departments of their training and compe-

tency in one subject, in which they must be advanced (although they may be less so, or even beginners, in other subjects), may be allowed entire freedom in their choice and combination of studies, and as special students may enjoy all the privileges of the University.

These students may, with the approval of the President, be received for less than an entire year.

VI. CANDIDATES FOR THE DEGREE OF MASTER OF ARTS.

By recent action of the Board of Trustees and the Faculty, students who have graduated from the Collegiate Department of Clark University may be received as members of the University and they, as well as graduates of other institutions, may become candidates for the degree of Master of Arts under conditions specified in each case by the departments which admit them to that degree.

VII. PRELIMINARY CANDIDATES.

Non-university students of less special or less advanced standing than the above classes, who contemplate becoming candidates for some higher degree, may also be received.

Students of this class must satisfy the authorities of the University of their attainments and

that they contemplate advancing to a degree higher than that of A. B. The privileges and status of these students will be more fully defined later. They may, in exceptional cases, be elected to Scholarships.

FELLOWSHIPS AND SCHOLARSHIPS.

From the George F. Hoar Fund of \$100,000, provided by the generosity of Andrew Carnegie, the sum of \$3,000 is now available for Junior and Senior Fellowships in the University. While the sums attached to these appointments are not fixed, a Senior Fellow may receive \$200 together with the remission of fees, which makes the value of the appointment \$300. A Junior Fellow may receive \$100 with remission of fees, which makes the value of the appointment \$200. Besides these, other appointments of Senior and Junior University Scholarships are made.

A CITIZEN'S FUND.

A citizen of Worcester has given a fund of \$5,000, the income of which is to be used for the aid of "some one or more worthy native born citizens of the city of Worcester who may desire to avail themselves of the advantages of the institution."

THE FIELD FUND.

Mrs. Eliza W. Field has also given \$500, to be called the "John White Field Fund," the income of which is "to provide for the minor needs of a Scholar or Fellow."

The following regulations apply to the award of the income of the Field Fund:

1. Regard is had to the intellectual ability of the candidate as well as to need of pecuniary assistance.

2. Only candidates who have spent three months at the University are considered.

3. The head of each department will consider and report to the Faculty desirable cases in his department.

4. Applications are received not later than December 15th, and the awards made as soon as possible after the Christmas recess.

PURPOSE AND CONDITIONS OF FELLOWSHIPS AND SCHOLARSHIPS.

Fellowships at Clark University are intended for young men and women of promise who desire to pursue post-graduate studies in order to fit themselves for intellectual careers. It is desirable, but not required, that candidates for these positions should intend to proceed to the degree of Doctor of Philosophy or to equivalent attain-

ments. In general, those intending to devote themselves to some special branch of learning are preferred to those directly fitting themselves for one of the three learned professions, although the latter are not excluded.

No application blanks are provided, but it is desired that the candidate should state fully and in writing his course of study and submit testimonials or diplomas, especially such as indicate a decided preference for some particular department. These should also, if practicable, be accompanied by some specimen of the candidate's work. Applications will be considered in May and in October and should be in the hands of the President on or before the first day of either month. In special cases vacancies may be filled by appointments at any time during the year. The names of unsuccessful candidates will not be made public.

Fellows must reside in Worcester during the entire academic year, devote themselves to special studies under the direction of their instructors, and give such evidence of progress or proficiency before the end of the year as the authorities shall require. It is generally expected that they will undertake some work of research during the year. They must co-operate in promoting harmony, order, and all the ends of the

University, must not teach elsewhere, and may be reappointed at the end of the year. Being intended primarily as honors, both Fellowships and Scholarships are awarded without reference to pecuniary needs, so that those able and desiring to do so may relinquish the emolument and retain the title of "Scholar" or "Fellow."

The paying fellowships will for the present be restricted to the departments of mathematics, physics, biology, psychology and education.

METHODS.

Besides field work, excursions to institutions (public and private), coaching and cram classes, clubs, examinations, conferences and other modes by which knowledge now seems best imparted and retained, the following educational methods are prominent:

LECTURES. The Trustees desire that each instructor, of however few students, should prepare and deliver regular lecture courses, with diagrams, illustrative apparatus, and reference to standard text-books and the best current literature upon each topic. Advanced students are also encouraged to supplement the work of the professors by giving occasional special lectures and courses. Public lectures will be given from time to time.

SEMINARIES AND CONFERENCES. These are stated meetings for joint systematic work, under the personal direction of the professor, in some special part of his subject. Here students preparing theses and other papers for publication in the journals edited at the University read them in incomplete form for mutual criticism and help. Here, also, the results of individual reading are reported for the benefit of all; views are freely criticised; new inquiries, methods, comparisons, standpoints, etc., suggested. From the mutual stimulus thus given, many important works have proceeded and the efficiency of universities has been greatly increased.

LABORATORY WORK. For beginners this has been from the first the best of all forms of apprenticeship, bringing student and professor to a closer and mutually stimulating relation. Here the manipulation of apparatus is learned, processes are criticised, results obtained by other investigators are tested, and methods discussed and perfected, with a view to developing that independence in research which is the consummation of scientific culture.

NOTICES.

The charge for tuition, giving all the privileges of the University, but not covering the laboratory fees, is \$100 per annum.

Board and lodging can be obtained near the University at very moderate rates.

Intending students will be given information, so far as possible, upon any of these or other points, in advance of official announcement, upon addressing the Clerk of the University, Miss Florence Chandler, Worcester, Mass.

All members of the University are expected to be present at the opening of each term and to continue in attendance to its close.

The following are the statements and announcements of the departments for the academic year, 1905-1906.

I.

MATHEMATICS.

PROGRAMME FOR 1905-1906.

INSTRUCTION IN MATHEMATICS.

The chief aim of the department is to make independent investigators of such students as have mathematical taste and ability; these naturally look forward to careers as teachers of the higher mathematics in colleges and universities, and we believe that the course of training best adapted to the development of investigators is also that which is most suitable for all who would be efficient college professors, even if they are not ambitious to engage in research. The first essential of success in either of these lines is the habit of mathematical thought, and the direct object of our instruction is the acquisition of this habit by each of our students. With this end in view, we expect every student to make himself familiar with the general methods and most salient results of a large number of different branches of mathematics, conversant with the detailed results and the literature of a few branches, and thorough master of at least one special topic to the extent of making a real contribution to our knowledge of that subject.

In accordance with these principles, the instruction is given by means of introductory, advanced, and special courses of lectures, seminars, and personal guidance in reading and investigation.

The introductory courses are usually given in alternate annual groups as follows:

Group A:

ANALYTIC GEOMETRY OF HIGHER PLANE CURVES, HIGHER SURFACES, AND TWISTED CURVES; 5 hours a week, through the year.

DIFFERENTIAL EQUATIONS, AND CALCULUS OF VARIATIONS; 5 hours a week, through the year.

Group B:

THEORY OF FUNCTIONS OF REAL AND IMAGINARY VARIABLES, ELLIPTIC FUNCTIONS, AND DEFINITE INTEGRALS; 5 hours a week, through the year.

THEORY OF NUMBERS; 2 hours a week, one-half year.

MODERN SYNTHETIC GEOMETRY; 2 hours a week, one-half year.

ALGEBRAIC SUBSTITUTIONS AND THEIR APPLICATION TO THE THEORY OF EQUATIONS; 2 hours a week, one-half year.

ALGEBRAIC INVARIANTS; 2 hours a week, one-half year.

FINITE DIFFERENCES; 2 hours a week, one-half year.

It is expected that every student will take each course in the earliest year of his residence in which it is given, unless he has already completed an equivalent course elsewhere. The chief object of these courses is to make the student familiar with the various methods of mathematical research and the concepts of mathematical thought at the present day. Thus, for example, curves and surfaces are treated by modern methods from the beginning, with adequate consideration of the discoveries of the great geometers of recent times. The usual college courses in the theory of algebraic equations, analytic geometry, and the differential and integral calculus furnish all the necessary preparation for these introductory courses, although it is very desirable that the student be acquainted with the properties of determinants and

their application to the solution of linear equations, and with the methods of solving differential equations of the simpler types. Deficiencies in these subjects may be made up by attendance on the corresponding courses in the Collegiate Department of the University.

A *Seminary* will be conducted in connection with each group, in which the students will be exercised in individual investigation and the oral presentation of results. The literature of the topics discussed will here receive adequate attention.

Special advanced courses, open to such as have nearly or quite completed the introductory courses, are given annually in subjects varying with the interests of the instructors and the needs of the students.

Each advanced student is placed under the supervision of one of the instructors for guidance in the original investigation of some special topic; the successful issue of this investigation may furnish material for the dissertation required of a candidate for the degree of Doctor of Philosophy.

For the academic year 1905-06, the following courses are offered.

By PROFESSOR STORY.

SEMINARY FOR ADVANCED STUDENTS; through the year.

Introductory course :

ANALYTIC GEOMETRY OF HIGHER PLANE CURVES, HIGHER SURFACES, AND TWISTED CURVES; 5 hours a week, through the year.

Advanced Courses :

PROBABILITIES; 2 hours a week, first half-year.

NON-EUCLIDEAN GEOMETRY; 2 hours a week, second half-year.

PROFESSOR TABER (absent on leave).

BY PROFESSOR WEBSTER.

[See announcement of Department of Physics, courses 7, 8, 9, 10.]

BY M. DE PEROTT.

Introductory courses:

THEORY OF NUMBERS; 2 hours a week, first half-year.

ALGEBRAIC SUBSTITUTIONS AND THEIR APPLICATION TO THE THEORY OF EQUATIONS; 2 hours a week, second half-year.

BY MR. ALLEN.

DIFFERENTIAL EQUATIONS AND CALCULUS OF VARIATIONS; 5 hours a week, through the year.

During the academic years 1889-1905, advanced and special courses have been given in:

1. THE HISTORY OF MATHEMATICS among various peoples from the earliest times to A. D. 1650.
2. THEORY OF NUMBERS.
3. LINEAR TRANSFORMATIONS AND ALGEBRAIC INVARIANTS, with applications to algebraic equations and geometry.
4. THEORY OF SUBSTITUTIONS, with applications to algebraic equations.
5. PLANE ANALYTIC GEOMETRY.
6. SOLID ANALYTIC GEOMETRY.
7. HYPERSPACE AND NON-EUCLIDEAN GEOMETRY.
8. ENUMERATIVE GEOMETRY.
9. QUATERNIONS, with applications to geometry and mechanics.
10. MULTIPLE ALGEBRA, including matrices, quaternions, the "Ausdehnungslehre," and extensive algebra in general.
11. MODERN SYNTHETIC GEOMETRY.
12. THEORY OF FUNCTIONS according to Cauchy, Riemann, and Weierstrass, with applications.
13. WEIERSTRASS'S THEORY OF ELLIPTIC FUNCTIONS.
14. ABELIAN FUNCTIONS AND INTEGRALS.
15. NUMERICAL COMPUTATIONS.
16. THEORY OF QUADRATIC FORMS.

17. ANALYSIS SITUS, particularly the connectedness of surfaces and map-coloring.
18. SURFACES OF THE THIRD AND FOURTH ORDERS (analytically treated).
19. PLANE CURVES OF THE THIRD AND FOURTH ORDERS (analytically treated).
20. KLEIN'S ICOSAHEDRON-THEORY.
21. ELLIPTIC MODULAR FUNCTIONS.
22. THETA-FUNCTIONS OF THREE AND FOUR VARIABLES.
23. RIEMANN'S THEORY OF HYPERELLIPTIC INTEGRALS.
24. SYMBOLIC LOGIC.
25. TWISTED CURVES AND DEVELOPABLE SURFACES (torses).
26. RATIONAL AND UNIFORM TRANSFORMATIONS OF CURVES AND SURFACES.
27. THEORY OF FUNCTIONS OF A REAL VARIABLE.
28. DEFINITE INTEGRALS AND FOURIER'S SERIES.
29. ORDINARY DIFFERENTIAL EQUATIONS, including differential equations with infinitesimal transformations, general theory of linear differential equations, Gauss's, Legendre's, and Bessel's functions.
30. PARTIAL DIFFERENTIAL EQUATIONS, including Laplace's, Bessel's, and Lamé's functions.
31. FINITE DIFFERENCES AND PROBABILITIES.
32. APPLICATIONS OF THE INFINITESIMAL CALCULUS TO THE THEORY OF SURFACES.
33. SIMULTANEOUS EQUATIONS, including Restricted Systems.
34. THEORY OF TRANSFORMATION GROUPS.
35. THE APPLICATION OF TRANSFORMATION GROUPS TO DIFFERENTIAL EQUATIONS.
36. THEORY OF ERRORS.

The advanced and special courses are not repeated at regular intervals, but properly prepared students will receive the personal assistance of one or other of the instructors in reading any subject not announced for the year in which they desire to take it.

The number and scope of the advanced courses given each year have been, thus far, regulated by the number

of students qualified to profit by them and by the individual interests of the instructors; these courses will be increased, both in number and variety, whenever a real demand for such an increase shall make itself apparent. While the present purely scientific character of the University precludes instruction in strictly technical branches, we hope that the time is not far distant when the demand shall make it advisable, and increased facilities shall make it possible, to announce courses in Descriptive Geometry, Graphical Statics, Mathematical Astronomy, Vital Probabilities, and all the more important applications of mathematics to other sciences and to technical subjects. The applications of mathematics to physics already receive adequate consideration, and the further extension of such applications awaits only a demand for it on the part of students.

Each year seminars for the training of students in methods of investigation are conducted by the several instructors, and those who have attained the necessary proficiency are personally directed in individual researches, of which the results are published in various mathematical journals.

The degree of Doctor of Philosophy is conferred upon such students as have completed all the introductory courses and a satisfactory number of advanced and special courses, have presented approved memoirs embodying the results of original investigation, and have passed creditable examinations in their principal department of study and in one subordinate department. Mathematical students are generally advised to offer theoretical physics as their subordinate subject, and facilities are given for acquiring the requisite knowledge of this subject during their first or second year at

the University.¹ Three years of University work are ordinarily necessary to obtain the degree.

Every facility for the study of special branches will be given to properly prepared students who are not candidates for the doctor's degree, and to those who, having already taken the degree (here or elsewhere), wish to continue mathematical study or investigation.

MATERIAL FACILITIES.

The library is provided with the more important textbooks, treatises, and memoirs on the various branches of mathematics, as well as the principal journals and transactions of learned societies that are devoted to any considerable extent to mathematics. Among the periodicals of which the library has complete or nearly complete sets are the following :

Abhandlungen der math.-phys. Classe der Königl. Sächsischen Gesellschaft der Wissenschaften. Leipzig, 1852 to date. Complete.

Acta Mathematica. Stockholm, Berlin and Paris, 1882 to date. Complete.

American Journal of Mathematics. Published under the auspices of the Johns Hopkins University, Baltimore, 1878 to date. Complete.

Annales scientifiques de l' Ecole Normale supérieure. Paris, 1864 to date. Complete.

Annali di Matematica Pura ed Applicata. Milano, 1889 to date.

Annals of Mathematics. Published under the auspices of Harvard University, 1899 to date.

Berichte über die Verhandlungen d. Königl. Sächsischen Gesellschafts. d. Wiss. zu Leipzig, 1889 to date.

Bibliotheca Mathematica. Stockholm, Berlin and Paris, 1887 to date.

¹For requirements see p. 51.

Bulletin de la Société Mathématique de France. Paris, 1873 to date. Complete.

Bulletin of the American Mathematical Society. Continuation of the Bulletin of the New York Mathematical Society. New York, 1894 to date.

Bulletin of the New York Mathematical Society, New York, 1891-94.

Bulletin des Sciences Mathématiques (Darboux, etc.). Paris, 1870 to date. Complete.

Comptes Rendus hebdomadaires des Séances de l'Académie des Séances. Paris, 1835 to date. Complete.

Educational Times, and Journal of the College of Preceptors. London, 1890 to date.

Jahrbuch über die Fortschritte der Mathematik. Berlin, 1868 to date. Complete.

Journal de l'École Polytechnique. Paris, 1794 to date. Complete.

Journal de Mathématiques pures et appliquées. (Liouville.) Paris, 1836 to date. Complete.

Journal für die reine und angewandte Mathematik (Crelle, etc.). Berlin, 1826 to date. Complete.

The Mathematical Review, Worcester, Mass.

Mathematische Annalen (Clebsch, etc.). Leipzig, 1869 to date. Complete.

Mathematische und Naturwissenschaftliche Mittheilungen aus den Sitzungsber. d. Königl. Preussischen Akad. der Wissen. zu Berlin. 1892 to date.

Messenger of Mathematics. Oxford, Cambridge and Dublin, 1862 to date. Complete.

Nachrichten von der Georg-Augusts-Universität und der Königl. Gessellschaft der Wissenschaften zu Göttingen. 1853-88.

Nouvelles Annales de Mathématiques. Paris, 1842 to date. Complete.

Philosophical Magazine and Journal of Science. London, Edinburgh and Dublin, 1798 to date. Complete.

Philosophical Transactions of the Royal Society. London. 1665 to date. Complete.

Proceeding of the Cambridge Philosophical Society. 1843 to date. Complete.

Proceedings of the London Mathematical Society. London, 1865 to date. Complete.

Proceedings of the Royal Society of London. 1800 to date. Complete.

Quarterly Journal, Pure and Applied, of Mathematics. London, 1857 to date. Complete.

Revue semestrielle des Publications Mathématiques. Amsterdam, 1893 to date. Complete.

Transactions of the American Mathematical Society. Lancaster, Pa., and New York, 1900 to date.

Transactions of the Cambridge Philosophical Society. 1822 to date. Complete.

Zeitschrift für Mathematik und Physik (Schlömilch, etc.). Leipzig. Complete from Vol. 34 (1888) to date.

The University possesses a set of Brill's admirable models (wanting only those published during the last few years, which will be obtained as soon as possible) and Björlings thread models of developable surfaces.

The department possesses also :

An Amsler Planimeter (with revolving table), and a Thomas Arithmometer.

II.

PHYSICS.

PROFESSOR WEBSTER will regularly deliver, with a period of two years, the following cycle of unstarred courses. The starred courses have been given, or will be given at irregular intervals. The lectures occupy from five to seven hours weekly.

1. DYNAMICS. GENERAL PRINCIPLES, CANONICAL EQUATIONS, METHODS OF HAMILTON AND JACOBI, SYSTEMS OF PARTICLES, RIGID BODIES.

2. NEWTONIAN AND LOGARITHMIC POTENTIAL FUNCTIONS, ATTRACTION OF ELLIPSOIDS.

2a.* FIGURE AND MOTION OF THE EARTH.

3. ELASTICITY, HYDRODYNAMICS, WAVE AND VORTEX MOTION, DYNAMICAL BASIS OF SOUND AND LIGHT.

3a.* DYNAMICS OF CYCLIC AND OSCILLATORY SYSTEMS, with APPLICATIONS TO THEORY OF ELECTRICITY, SOUND AND LIGHT.

3b.* THE THEORY OF RESONANCE, AND THE MEASUREMENT OF SOUND.

4. ELECTRICITY AND MAGNETISM.

4a.* RECENT DEVELOPMENTS IN ELECTRICAL THEORY.

5. OPTICS, PHYSICAL AND GEOMETRICAL. ELASTIC AND ELECTROMAGNETIC WAVE-THEORIES.

5a.* COMPARISON OF THE THEORIES OF THE ETHER.

6. THERMODYNAMICS, THERMO- AND ELECTRO-CHEMISTRY, KINETIC THEORY OF GASES, RADIATION.

7. THE PARTIAL DIFFERENTIAL EQUATIONS OF MATHEMATICAL PHYSICS.

Laplace's Equation, Equation of Thermal and Electrical conduction, Equation of Wave-motion, Telegrapher's Equation, Developments in Series, Legendre's, Laplace's, Bessel's and Lamé's Functions.

8.* LINEAR DIFFERENTIAL EQUATIONS.

9.* ELLIPTIC FUNCTIONS, with certain physical applications.

10.* ORTHOGONAL SURFACES AND CURVILINEAR COORDINATES, and their applications.

The courses for the year 1905-06, will be 5, 5 a, 6, 7. (1, 2, 3, 4, 4 a have been given this year.)

(The substance of courses 2, 3 a, and 4 is to be found in Dr. Webster's Treatise on the Theory of Electricity and Magnetism, Macmillan & Co., London and New York. That of courses 1, 2, 2 a, 3, 3 a is contained in his Treatise on Dynamics, B. G. Teubner, Leipzig.)

In addition to the above courses, there is held a weekly Colloquium, or meeting for the informal discussion of subjects not treated in the lectures, and for the presentation of summaries of important articles appearing in the journals.

A part of the work of the colloquium consists in the systematic presentation of certain classical researches, connected more or less with the lectures, in preparing which the students make use of the original sources of information, thus gaining much experience in methods of research. The work of the colloquium has an excellent effect in training students to present their ideas in a systematic manner before an auditory.

In addition to the lectures announced above, advanced courses may occasionally be given on subjects not included in the list of starred courses.

The aim of the department is to insure in its students some acquaintance with all the various fields of experimental physics, to develop in them the power of exact measurement, to accustom them to exact reasoning from experiment to theory, and to encourage original research conducted on a sound basis. To this end students will be put at work in the laboratory upon experiments of sufficient difficulty to give them skill in measurements

of precision, and to enable them to become familiar with the precautions and corrections necessary to be employed in exact work. After a sufficient amount of experience has been gained, and the student has shown himself to be possessed of sufficient originality to warrant independent investigation, he will be encouraged to take up for himself an original research in the hope of making a personal contribution to science. In this research he will have at all times the benefit of the direction and advice of the professor.

In the belief that no sound knowledge of physics is at the present day possible without a clear appreciation of the means of expressing facts in accurate form, from which exact deductions may be drawn, much stress is laid on the acquisition of familiarity with the application of mathematical analysis to physics, and the courses of lectures are shaped with that end in view. These aim to give the student some acquaintance with the whole field of theoretical physics, to familiarize him with those general methods that appear in the various branches and to show him how he may avail himself of them in practice. It is the constant endeavor in the lectures to bring out the physical essence that is concealed in the formulæ, in order that the student may recognize not merely the formula, in whatever department of physics it may occur, but the physical truth involved. As an instance may be mentioned the treatment of the partial differential equation of Laplace, whose meaning, whether in connection with distributions of Newtonian force, with the steady flow of heat or electricity, certain cases in hydrodynamics and sound, or in the theory of magnetic and electric induction, is physically the same, and indicates what was termed by Faraday the tubular, or sole-

noidal, distribution of a vector. Further examples are furnished by the geometrical properties of linear vector functions, of so frequent occurrence, and by the properties of such vector functions that one represents the "curl," or "rotation," of another.

Before all things, however, are made prominent the idea of Energy and its laws, so that in each department the subject is developed as far as possible from the mathematical expression of the energy involved. Physics may be defined as the Science of Energy, and it is attempted, as far as possible, to make each portion of mathematical physics depend upon simple dynamical principles.

The value of a sound knowledge of dynamics to the student of physics cannot be overestimated, and the course in dynamics forms the natural foundation for the remaining courses.

It should be urged upon intending students to prepare themselves, not only in ordinary laboratory measurements, but also in mathematics, the lack of proper mathematical preparation being a serious drawback to the appreciation of the lectures. In particular may be recommended for study not merely those portions of the calculus which deal with the working out of many indefinite integrals, etc., but the theoretical portions which deal with the ideas of partial derivatives, definite integrals, and their practical manipulation, together with enough analytic geometry to involve the properties of lines and *surfaces* of the second order, and a fair amount of the elements of determinants. As suitable textbooks for preparation may be recommended to the student Lamb's, Gibson's, Williamson's, or Byerly's Differential and Integral Calculus, C. Smith's Analytical

Geometries, and Muir's or Hanus's Determinants. Appell, *Éléments de l'analyse mathématique*, may be very strongly recommended to the intending student for study before and during his course at the University.

It cannot be too strongly urged that the student should, from the beginning, be able to read French and German with ease and to make use of works in them.

REQUIREMENTS FOR THE DOCTOR'S DEGREE.

1. The ability to read at sight specimens of scientific French and German, tested before the first of November preceding the doctor's examination by a committee of two members of the Faculty.

2. The successful passing of an examination upon the general subject of Experimental Physics¹ and upon the subjects named above in the regular course in Theoretical Physics, as a major requirement, together with an examination in one minor subject, to be determined in each particular case by the head of the Physical Department. This subject will be Mathematics or Chemistry.

3. The presentation of a satisfactory dissertation, involving a substantial amount of original work, and forming a contribution of value to pure science. The presentation of the dissertation is a prerequisite to examination.

The time of residence necessary for the proper fulfilment of the above requirements will generally be at least three years, of which at least one will be very largely devoted to work on the dissertation. Students will not be encouraged to enter upon the work of a dissertation until they have acquired sufficient experience to enable them to specialize with advantage.

The aim of the department is to produce physicists rather than electricians, acousticians, opticians, engineers, or narrow specialists of any sort, for although in the nature of things one will be obliged to know more of one subject than of others, yet it seems evident that no thorough knowledge of any branch can be gained without a comprehensive view over the whole subject.

¹ Every student is recommended to provide himself with Winkelmann's *Handbuch der Physik* as a work for continual reference.

Without this the specialist, or the experimentalist lacking a knowledge of mathematics, will continually be falling into pitfalls which the more wary avoid. Furthermore, it can be but a detriment to science to encourage research in new fields by immature and ill-prepared minds and hands.

The following statement is here inserted for the benefit of students of mathematics.

The minor in Mathematical Physics consists of the subject-matter of courses 1, 2, 3 and 7, which are intended to constitute the equivalent of five hours a week for one year. Course 7 is given in alternate years to the other courses. The subject-matter of the course is contained in Dr. Webster's treatise on *Dynamics*, and Riemann-Weber's *Partielle Differentialgleichungen*.

FACILITIES.

At the beginning of the year 1903-04 the Physical Department was moved from the rooms it formerly occupied in the main building to the unoccupied wing of what was formerly known as the chemical building, which was remodelled to accommodate the department. This affords convenient and commodious quarters separate from all other departments, and quite free from disturbance, the chemical laboratories being in the other wing separated by a tight partition. On the ground floor is a room extending across the end of the building, with windows on three sides, forty-five feet long by twenty-two feet wide, above which are three other similar rooms. A lift running from the bottom to the top floor affords a means of transporting apparatus, while its shaft furnishes space for manometer or barometer tubes. In the lower room are four piers with heavy stone tops, and two others below the floor on which can be placed heavy tables. The other rooms on the ground floor are a large dark room, partially below ground, in which the temperature is tolerably constant, containing a very large and heavy pier. The engine and storage-battery room containing a high-speed steam-engine connected with the heating boiler and a kerosene engine on the same foundation, with the dynamo between, and seventy-five cells of storage-battery, furnishes the power supply. The

storage-cells are conveniently arranged so that each one is accessible from each side, above and below, and the ventilation is excellent, while the room is as light and clean as the work-rooms. Distributing switch-boards enable the current from the dynamo or any section of the battery to be supplied to any of the rooms. On the same floor are three rooms constituting the work-shop, one of the most important parts of a research department of physics. The first room is devoted to wood-working and pattern-making, and accommodates also a bench for soldering. The next room contains the machinist's bench, two engine lathes, jeweller's lathe, and planer, and the third room a Rivett precision bench lathe. There is no countershafting in the building, each tool being driven by a separate electric motor, while the capacity of the battery is such that for ordinary purposes it is not necessary to drive the engine for the shop alone, so that perfect quiet and steadiness are ensured. In the shop are executed all repairs and alterations of apparatus, and in addition is constructed the new apparatus requiring continual experiment. Most of the principal pieces of apparatus belonging to this department have been here constructed. In this manner, by having a mechanic always present, an extremely great economy in time and money is effected, and vexatious delays, which would otherwise completely arrest the progress of the work, are avoided. Facilities are also given for the students to construct apparatus for themselves.

On the main floor are the lecture room, the director's office, the large room used as the director's private laboratory and apparatus room, and three other convenient rooms for research. Two of these are arranged so that they may be darkened for photography, and are also fitted with chemical hoods. The large room on the top floor is intended to be used for optical purposes. Every room in the laboratory contains sinks, gas and electric light connections, and several circuits connecting with the switch-board in the battery-room.

The laboratory is well equipped with apparatus for research, besides having the facilities above described for the construction of instruments of any sort needed for that purpose. In addition may be mentioned a large collection of diagrams illustrative of mathematical physics, many of them being originals of the figures in Dr. Webster's "Electricity and Magnetism,"

and "Dynamics," and a number of interesting models used in teaching dynamics, thermo-dynamics, and electricity, the number of which is continually increasing, and some of which are rarely found. Among these are Maxwell's Dynamical Top and a number of other interesting tops, Rayleigh's induction model, Gibbs's and other thermo-dynamical surfaces.

THE LIBRARY.

Among the most important of the facilities of any department is of course to be named the library, and among the first questions naturally asked may be expected those relating to the accessibility of books to students and the conditions regarding their use.

The library of the Physical Department is large and carefully selected, and in mathematical physics particularly, may fairly be said to contain the best works. Among others may be mentioned:

Collected Writings of Helmholtz, Hertz, Clausius, Kirchhoff, Kelvin, Lorentz, Green, Hopkinson, McCullagh, Joule, Stokes, Maxwell, Rankine, Rayleigh, Regnault, Reynolds, Rowland, Tait, Young, Gauss, Fourier, Laplace, Cauchy, Foucault, Fresnel.

Potential, Electricity and Magnetism. Riemann, Betti, Dirichlet, Mathieu, Somoff, Kirchhoff, Neumann, Minchin, Routh, Clausius, Duhem, Maxwell, Boltzmann, Drude, Mascart and Joubert, Watson and Burbury, Gray, Heaviside, Thomson, Poincaré.

Elasticity. Mathieu, Ibbetson, Love, Todhunter and Pearson, Williamson, Clebsch, Neumann, Lamé, Boussinesq, Résal, Poincaré.

Hydrodynamics. Bassett, Lamb, Kirchhoff, Neumann, Poincaré, Wien.

Light. Mascart, Kirchhoff, Helmholtz, Neumann, Volkmann, Drude, Résal, Poincaré, Bassett, Preston, Schuster, Walker.

Heat. Clausius, Kirchhoff, Rühlmann, Boltzmann, Voigt, Zeuner, Bertrand, Duhem, Poincaré, Preston.

Sound. Rayleigh, Donkin.

A large number of treatises on Mechanics, and a set of the *Travaux et Mémoires du Comité International de Poids et Mesures*, and of the published memoirs of the *Physikalisch-technische Reichsanstalt*, may be also mentioned.

Among the journals are complete sets of the

Annalen der Physik und Chemie.

Comptes Rendus.

Eclairage Electrique.

Journal of Physical Chemistry.

Nature.

Philosophical Magazine.

Philosophical Transactions.

Physical Review.

Physikalische Zeitschrift.

Proceedings Royal Society.

Science.

Science Abstracts.

Zeitschrift für Instrumentenkunde.

The library subscribes to the following journals.

American Journal of Science.

Annalen der Physik.

Annales de Chimie et de Physique.

Bieblätter zu den Annalen der Physik.

Comptes Rendus.

Eclairage Electrique.

Electrical World.

Electrician.

Elektrotechnische Zeitschrift.

Journal of Physical Chemistry.

Journal de Physique.

Nature.

Il Nuovo Cimento.

Philosophical Magazine.

Philosophical Transactions.

Physical Review.

Physikalische Zeitschrift.

Proceedings Royal Society.

Science.

Science Abstracts.

Verhandlungen der Deutschen Physikalischen Gesellschaft.

Zeitschrift für Instrumentenkunde.

III.

CHEMISTRY.

The courses in chemistry leading to the degree of Master of Arts are intended to provide work of an advanced nature which shall supplement the elementary work of the undergraduate in such a way as to give the student a broader and more comprehensive view of the subject. At the same time it is intended to encourage in the student a desire for independent investigation, and to offer opportunity for doing specialized work. The work in its general nature falls into the two following groups :

I. Courses of lectures and laboratory work designed to increase the student's general knowledge of chemistry, including such subjects as the chemistry of the rare elements, usually not treated in elementary courses; methods of making pure preparations; analytical methods, qualitative and quantitative; electro-chemistry; optical and photo-chemistry and other special branches of physical chemistry; organic preparations and special methods of organic analyses.

II. Research courses in which the knowledge already acquired is applied to the acquisition of further knowledge through the agency of original investigation.

The laboratory work is much more individual in character than is possible in elementary work. The student is encouraged to undertake that line of work in which he is especially interested, and opportunity is offered to take up any special subject desired, under the direc-

tion of the instructor. The laboratory work will thus be varied to suit the needs of the individual and will partake more of the nature of independent investigation than is possible with the prescribed work of the elementary courses. This work will be supplemented by lectures dealing with the theoretical aspects of the subject, and accompanied by general reading and seminary work.

The exact nature and amount of work required for the degree of Master of Arts will be determined individually. In general, it will be work of advanced grade to occupy most of the student's time for one year. This work may be all in this department, or it may be partially in one or more other departments, with the approval of the instructors in those departments.

The lecture course will be varied from year to year to meet the requirements of students. For 1905-1906 the following courses will be offered by DR. MERIGOLD:

ADVANCED INORGANIC CHEMISTRY. Lectures and laboratory work dealing with special analytical methods; sources of error; the chemistry of the rare elements; preparation of pure inorganic compounds. Special consideration will be given in the lectures to the theoretical side of these subjects. The laboratory work may be varied to include any subject along these lines, in which the student may be interested.

ELECTRO-CHEMISTRY. Lectures and laboratory work. An elementary knowledge of electricity and electrical measurements is a prerequisite for this course.

PHYSICAL CHEMISTRY. Lectures and laboratory work. A general elementary knowledge of the subject is presupposed.

SEMINARY. Reports and discussion of contemporaneous work appearing in current journals, and presentation of special topics.

RESEARCH. Students who have sufficient preparation may take up some line of chemical investigation.

Candidates for the degree who are specializing in chemistry, may, if desired, devote all their time to any one of the subjects outlined above, with the exception of the seminary work, which is required of all who make chemistry a major subject.

Students for whom chemistry is a minor subject may take up any course for which their previous training has prepared them.

In the laboratory work students are expected to become familiar with the literature bearing upon their subject. Consequently a reading knowledge of French and German is essential.

In special cases, when satisfactory reasons exist, either the lectures or the laboratory work of the lecture courses may be taken separately.

IV. BIOLOGY.

PROGRAMME FOR YEAR 1905-1906.

DR. HODGE will offer the following courses:

I. DYNAMIC BIOLOGY AND GENERAL PHYSIOLOGY. It is proposed to combine in this course the fundamental laws and principles of biological science, the emphasis being placed on the functional or dynamic side rather than on the side of morphological structure. In other words, the point of view of the course is that living species have assumed certain forms and have developed definite structures in order to fit them to perform a certain work in the economy of nature. Among others, the following topics will serve to outline the scope of the course. Origin and constitution of living matter. Physiological functions. Classification of plants and animals. Biological reactions, tropisms, experimental morphology. Differentiation of organs. Growth and reproduction. Heredity. Variation. Specialization. Evolution. One lecture weekly, October to June. Laboratory work will be arranged to meet the needs of individual students.

II. BIOLOGICAL EDUCATION. The University stratum—history, aims and methods of biological research. The College level—outlines of college courses and history of their development. Biology in the high school. Biological nature study for the elementary schools. Eight lectures, to be arranged for by consultation during the year.

DR. THOMPSON will offer the following course:

III. VERTEBRATE EMBRYOLOGY. Fifteen lectures with laboratory work which will aim to cover the fundamental phenomena of embryology; fertilization, maturation cleavage and the differentiation and development of organs and tissues.

A biological seminary will be held one evening weekly throughout the year. In general the work of this seminary is planned to run on the plan of a three year cycle as follows: first year, history of science and of biological research; second year, phi-

losophy and historical development of evolution; third year, the laws of heredity and variation. The year 1905-1906 will begin the cycle.

NEUROLOGY.

It is intended to arrange the course in such a manner that the general field may be covered in two years. This will leave the student free to devote his entire time during the third year to special study in the literature of the science and to the prosecution and completion of his thesis work. Accordingly a two year cycle will be arranged as follows:

IV. COMPARATIVE STUDY OF NERVOUS SYSTEMS AND SENSE ORGANS. This course will form the natural basis for comparative psychology and together with the working out of a minor problem may well constitute a minor for one whose major is psychology or philosophy. On the biological side it will be closely correlated with general physiology and morphology. It is intended to begin with a comparative study of the structural elements of the nervous system of both invertebrates and vertebrates and then correlate and compare the differing degrees of complexity of function with the anatomical organization found in the ascending series. The course will be illustrated throughout by diagrams, models, dissections and microscopical preparations and experiments. Laboratory work one afternoon weekly, or will be arranged to meet the needs of individual students. One hour weekly for general class exercise, or its equivalent.

V. THE HUMAN NERVOUS SYSTEM AND SENSE ORGANS. This course will deal with the anatomy, both gross and microscopic, and with the physiology and hygiene—fatigue and sleep, growth and development, localization—of the brain. One hour weekly, or the equivalent. Laboratory, one afternoon a week, or arranged to meet needs of individual students.¹

By way of supplementing the above and courses in

¹For elementary courses in special physiology, histology and hygiene, refer to announcement of biological courses in the Collegiate Department.

other departments of the University, three special courses have been planned as follows:

VI. PRACTICAL HISTOLOGY. The course will be purely a laboratory course, with such lectures, directions and conferences as may be required by those taking it. It will be arranged practically to meet the needs of individual students. Considerable latitude will be given, so that any who wish may make it a comparative study by way of supplementing course I, prepare a series of demonstrational specimens for themselves, or devote their time to special problems.

VII. For those who do not take work in the laboratory, but desire to see the actual specimens and experiments, a course of demonstrations to run somewhat parallel with the above courses will be offered. One hour weekly, through the year.

EXPERIMENTAL WORK.

Laboratory work in biology, physiology, and histology and neurology is arranged to meet the needs of individual students. Its general purpose is to facilitate practical familiarity with methods of research, and as soon as practicable each student is expected to begin an original investigation. Standard apparatus of most improved types is at the disposal of the laboratory, and when new work requires specially devised apparatus, every effort within the means of the department is made to obtain it. A workshop supplied with lathe and good equipment of tools for working both wood and metal is attached to the laboratory, and with these facilities minor pieces of apparatus may be well made or old apparatus altered to suit the demands of new problems. The aim of the laboratory is thus to place at the disposal of men interested in the solution of physiological and neurological problems the best obtainable facilities for the prosecution of their work. In case a man has not de-

cided on a special line of research, the resources of the department are such that he will be given a fairly wide range of problems, from which he may select a subject suited to his tastes and attainments. A course in biology, such as is given in our best colleges and State universities, is sufficient to enable students to begin work here.

It is proposed during the year to focus attention so far as practicable upon experiments relating to heredity, the influence of environment upon variation and upon the study of animal activity, normal rhythms of rest and work in a series of animals as related to structure and physiological condition of the nervous system. Incidentally this will include the gathering of data as to functions and work of animal species.

While no regular laboratory fees are charged, each student is expected to refund to the laboratory the cost price of all the more expensive reagents, including alcohol, ether, chloroform, formalin, celloidin, and the like. Each student must supply his own microscopical glass, slides and covers, and must pay the cost price of all glassware which he breaks. All students are enjoined to take the best possible care of all apparatus entrusted to their charge, and to return it to the laboratory clean and in good order.

The library of the department has been selected with two important considerations in view. The first of these has been to obtain the standard classics in the science. The second is to keep abreast of the times by having the best recent literature readily accessible both for study and reference. This latter class of selections thus includes monographs and text-books and current numbers of journals, with complete files of many of the

more important. A complete set of indexes, Jahresberichte and Centralblätter greatly facilitates the work of referring to the literature of topics under investigation in the laboratory.

THE JOURNAL CLUB meets weekly, for the purpose of reporting and discussing important articles in the current periodicals.

A complete list of the Journals will be found in the *Publications* of the Library.

V.

ANTHROPOLOGY.

DR. CHAMBERLAIN will lecture twice a week throughout the year. The courses offered will be selected from the following:

A. GENERAL, embracing: (a) HISTORY, scope and relations of the science of Anthropology. (b) PHYSICAL ANTHROPOLOGY. Problems, investigations, results, laboratory work. (c) ETHNOGRAPHY. Races and race-origins. (d) ETHNOLOGY, INCLUDING SOCIOLOGY; origin and development of the arts and sciences; institutions; mythology; folk-lore; religions. (e) LINGUISTICS. Race and Language. Origin and development of language and of languages. Psychology of language. Gesture-speech and written language. Comparative linguistics. Comparative literature. (f) CRIMINAL AND PATHOLOGICAL ANTHROPOLOGY, Physical and Mental, Ethnic Morals. (g) HISTORICAL AND ARCHÆOLOGICAL. Primitive Man and Primitive Culture.

B. SPECIAL COURSES upon Anthropological Topics most akin to Psychology and Pedagogy, embodying the results of the most recent and important studies and investigations of the following and other subjects: The Physical Anthropology of Infancy, Childhood, Youth, Manhood, Old Age; The Anthropological Phenomena of Growth, Arrested Development, Degeneration; Anthropological Aspects of Heredity and Environment in the Individual and in the Race; Uncivilized Races and Civilized Races; The Phenomena of Race-mixture; The Evolution Problems of Humanity; Education among Primitive Peoples; the Anthropological History of America; the Interpretation of Folk-lore; the Psychology of Primitive Peoples; the trend of Human Progress; the Psychology of Primitive Languages; The Mind of Primitive Man and its Expression; The Rôle of the Individual in Primitive Culture; Progress and its Criteria; the Orient and the Occident.

The lectures in Anthropology will have special bearing upon

the courses in Psychology and Pedagogy in the University, and every effort will be made to utilize the latest results of Anthropological investigations.

From time to time, the most valuable current literature will be reviewed and students made acquainted with the best contributions to Anthropological Science in the various foreign languages. The importance of a thorough acquaintance with the bibliography of their subjects is impressed upon all students, and all possible assistance in this direction is always at their disposal.

VI.

PSYCHOLOGY.

A complete course in Psychology at Clark University includes the following subjects:

I. Anatomy and Physiology of the Brain and Spinal Cord; senses; and other parts of the body, especially the muscles, the organs of the will, so far as they affect psychological powers and processes, with a good general background of biology. For this a special laboratory is equipped. See Dr. Hodge's announcement.

II. Physiological and Experimental Psychology, including Reflex Action; Fatigue and Rest; Sleep; Hypnotism; Automatism; Temperaments; Interaction of mind and body generally. Laboratory methods and apparatus for the study of the Senses, Reaction-time, Memory, Attention, Association, Will, Feelings, etc. For this a special laboratory is equipped. See Dr. Sanford's announcement.

III. Comparative and Genetic Psychology. Observation and experiments upon the mental processes of lower animals, including both microscopical and larger forms, and especially (when practical) the observation of dawning intelligence during animal infancy; questions of instinct and psychical heredity; and the parts of the general field common to biology and psychology. See announcements of Dr. Hall and Dr. Sanford.

IV. Abnormal and Morbid Psychology, as nature's experiments, *e. g.*, Border-line phenomena as seen in neurotic people, prodigies, and geniuses; Defectives, such as the blind, deaf, criminal, idiotic; Mental and Nervous diseases, epilepsy, phobias, neurasthenia, hysteria; Morbid modifications of will, personality and emotion, etc. Special clinical facilities for this work are open to the department in the hospitals and other institutions of the city. See Dr. Hall's lectures and Dr. Cowles's lectures and clinic.

V. Anthropological Psychology; Myths, Custom and Belief, Comparative Religion and Psychology of Religion, Primitive

Art, and the study of the life of savages and children; Adolescence and senescence; Physical measurements illustrating laws of growth in size and power, etc. See Dr. Chamberlain's courses.

VI. *Æsthetics and Ethics*, the psychology of music, painting, literature, the phenomena and laws of volition and morality.

VII. *History of Psychology and Philosophy*, including the chief culture institutions, science, medical theories, Christianity, and education generally. Dr. Hall's historical courses and seminary.

VIII. *Applications of Psychology, Pedagogy*, including mental and moral hygiene and regimen, school organization and methods from kindergarten to university; the sex problem; defectives, etc. Dr. Hall's and Dr. Burnham's courses.

The aim of the Psychological Department is to cover this field as well as its instructors are able to do in two or three years.

THE PSYCHOLOGICAL LABORATORY consists of a suite of eleven rooms on the third floor of the main building, devoted to the following purposes: 1, Lecture Room; 2, Large Dark Room; 3, Seminary and Departmental Library; 4, Office of Director; 5, Apparatus and preliminary setting up of apparatus; 6, 7 and 8, Rooms for demonstration and research; 9, Shop; 10, Photographic Dark Room; 11, Room for the keeping of animals and for Comparative Psychology. In floor space and favorable situation the Laboratory leaves little to be desired.

The department is well supplied with apparatus for both demonstration and research, and has access also to the collections of the physical and biological departments, and that of the psychological department of the College. Many pieces have been manufactured at the University and a considerable number have been designed here for special researches. The collection is constantly increasing by purchase or construction, especially in apparatus for research.

The Psychological section of the Library is full on EXPERIMENTAL AND PHYSIOLOGICAL PSYCHOLOGY, and upon THE PSYCHOLOGY OF RELIGION and the STUDY of CHILDREN. The section on criminology and related topics is also large. All the more important psychological journals in English, French, German and Italian are received regularly at the University and complete sets of the most important are upon the shelves of the library.

The following courses are announced for the academic year 1905-1906.

DR. HALL'S COURSES.

Dr. G. Stanley Hall will give the following courses:

I. THE HISTORY OF CONTEMPORARY PHILOSOPHY.

II. THE DEVELOPMENT OF MIND IN ANIMALS, CHILDREN AND THE RACE. This will be a review course, more by conference than by lecture. It will cover all the main lines needed for child study, a demonstration of the literature on each topic, and also the logic and methodology of the various kinds of work.

III. THE PSYCHOLOGY OF RELIGION AND OF CHRISTIANITY. This course will be more amplified and cover different ground from that of past years.

IV. EDUCATION. The topics and stages of education from the kindergarten to the university. This will include the pedagogy of each chief subject and also the functions and problems of each stage of educational work.

V. SYSTEMATIC PSYCHOLOGY FROM AN EVOLUTIONARY AND EMPIRICAL STANDPOINT, beginning with Sensations.

VI. SEMINARY, at his home, three hours every Monday evening, through the year.

VII. RESEARCH.

DR. SANFORD'S COURSES.

The following courses or their equivalents will be given by Dr. Sanford:

A. EXPERIMENTAL AND COMPARATIVE PSYCHOLOGY.

1. *Experimental Psychology: Problems, Methods and Results.* Lectures and demonstrations. One hour a week, throughout the year.

2. *Psychological Seminary.* Short lecture courses on special topics. Readings from the psychological classics. Reports and discussions on topics of current psychological interest. The work in the Seminary is informal and is varied to suit the needs of those attending it. One hour a week throughout the year.

3. *Research.* Advanced students are directed in research upon Experimental and Comparative Psychology by Dr. Sanford. The laboratories are open for advanced work at times suited to the convenience of those engaged in it.

B. GENERAL PSYCHOLOGY.

Students of Pedagogy and others desiring a general and elementary account of the subject are admitted, without extra expense, to the work of the Collegiate Department of Psychology.

PSYCHIATRY.

Dr. Cowles, former head of the McLean Hospital at Waverley, Mass., has now been appointed lecturer on psychiatry, and will give a course at the University and clinical demonstrations at the Worcester Insane Hospital.

DR. COWLES'S Course for the year 1904-1905 includes the following topics:

1. The dependence of psychiatry upon psychology as essentially the study of mental function and its disorders in the domain of physiology.

2. The relation of psychology and psychiatry to the prevailing morphological conceptions of general medicine and the difficulty of harmonizing them.

3. Mental physiology; imperative ideas, obsessions, and psychological automatism.

4. The mental symptoms of nervous exhaustion. Forms of mental diseases—(mental symptoms essentially constituting the disease-forms).

5 and 6. The "symptomatic and functional" psychoses (not

tending to dementia). The phases of "melancholia" and "mania;" "confusional insanity."

7 and 8. The deteriorating psychoses (tending to dementia), Dementia præcox (hebephrenic, katatonic, and paranoid forms), Paresis, Senile dementia.

9. The chronic psychoses (not tending to grave dementia). Involution psychosis. Primary delusional insanity,—paranoia.

10. Insanities from Mental Defect. Imbecility, Idiocy, Moral insanity.

The following are the lectures of Docents and Honorary Fellows in the Department of Psychology during the current year:

DR. JEAN DU BUY. The Teaching of Kung-tsze (Confucius).

1. The personality of Kung-tsze. The superior man.
2. The love of learning and of virtue.
3. The cultivation of the person.
4. The cultivation of the person and the regulation of the family.
5. The government of the State.

DR. JOHN W. SLAUGHTER. *Æsthetics*.

1. Historical Introduction.

I. *Art-Production*.

2. Theories of the Art-Impulse.
3. The Emotions and their Expression.
4. The Artistic Imagination.

II. *Art-Perception*.

5. The *Æsthetic* Reaction in General.
6. *Æsthetic* Satisfaction.
7. Theories of Art-Perception.
8. The Sensory Elements.
9. The Formal Principles.
10. Meaning by Association.
11. Meaning by Apperception.
12. The *Æsthetic* Judgment.

III. *Art and the Social Order*.

13. Function of Art in Social Development.
14. Early Stages in Artistic Conception.
15. The Ideal in Historical Times.

DR. LOUIS W. FLACCUS. Varieties of Moral Experience.

1. Moral Experience (Introductory). 2. Moral Experience (Concluded). The Objective Type. 3. The Sympathetic Type. 4. The Self-centred Type. 5. The Social Type. 6. The "That is Not Like You" Type. 7. The Aspiration Type. 8. The Symbolic Type. 9. Some Practical and Educational Aspects.

DR. FRED KUHLMANN Mental Imagery and Memory.

1. Historical Introduction, problem, standpoint and terms.
2. The Place of Mental Imagery and Memory among the Mental Functions.

3. Organization of Mental Imagery and Memory.

4. The Memory Curve.

5. Analysis of the Recognitive Consciousness.

6. Illusions of Memory.

7. Summary of Practical Aspects.

MR. JOSIAH MOSES. Pathology of Religion.

GENERAL INTRODUCTION.

1. Pathological Religious Experience due to Emotional Abnormalities.

2. Asceticism and Monasticism.

3. Mysticism.

4. Fetichism, Symbolism, and Interpretation.

5. Pathological Religious Beliefs and Doubts.

6. Fanaticism and Organization.

DR. GEORGE E. PARTRIDGE. Individual Psychology.

1. Standpoints Derived from General Psychology.

2. The Study of Individuals.

These lectures, including DR. COWLES's course, are open without fee:—

(1) To all members of the Faculty of the University and College;

(2) To all members of the Psychological Department, and to members of the College who are taking other psychological courses in the University.

All others will be admitted by ticket, now procurable at the office. The price for Dr. Partridge's course is \$2.00, and for each of the other courses \$5.00.

VII.

EDUCATION.

This department offers a course which can be taken as a minor for the degree of Doctor of Philosophy. Its work is in the closest connection with that of psychology and anthropology, and in part based on these subjects. The work in this department is intended to meet the needs of the following classes of students.

First. Those intending to teach some other specialty, but who wish a general survey of the history, present state, methods, and recent advances in the field of university, professional and technical education.

Second. Those who desire to become professors of pedagogy, or heads or instructors in normal schools, superintendents, or otherwise to become experts in the work of education.

The programme of the Educational Department includes courses upon the following subjects:

I. (a) CHILD STUDY. (b) EDUCATIONAL PSYCHOLOGY. (c) SCHOOL HYGIENE.

II. (a) PRINCIPLES OF EDUCATION. (b) HISTORY OF EDUCATION AND REFORMS. (c) METHODS, DEVICES, APPARATUS, ETC.^a

III. (a) ORGANIZATION OF SCHOOLS IN DIFFERENT COUNTRIES. (b) THE TEACHING PROFESSION. (c) MOTOR EDUCATION, including manual training, physical education, etc. (d) MORAL AND RELIGIOUS EDUCATION. (e) IDEALS.

The courses in Education for 1905-1906 will be as follows:

DR. BURNHAM'S COURSES.

A. THE HYGIENE OF THE SCHOOL CHILD. This course is

supplementary to the course on the hygiene of Instruction given in 1904-05. Some of the more important chapters in modern school hygiene will be considered including such topics as:—The conditions that determine growth and development. The general principles of somatic and mental hygiene. The hygiene of the senses. Modern studies of defects of sight and hearing. School diseases. The hygiene of the voice, the mouth, the teeth, the nose. Mental diseases and faults of children. Neuroses of development. Tests of ability to work and of physical condition. Medical inspection. The hygiene of discipline. The development of healthful mental activity. Hygiene of memory, of attention, and of feeling. The hygienic aspect of some psychological studies. *Once a week, Saturdays, throughout the year.*

B. THE TEACHING PROFESSION. The essential characteristics of a learned profession. The teacher and the parent. The teacher and the artisan. The teacher in ancient civilization; in China, India, Greece, Rome, etc. The mediæval teacher. The teacher of the early Renaissance. The Reformation. The great modern schoolmasters, Sturm, Comenius, F. A. Wolf, Pestalozzi, *et al.* The teaching profession in Germany. The function of the teacher in social evolution. The functions of the teacher in the schoolroom. Characteristics of the teaching profession as a social group. Fundamental principles concerning the training of teachers. Different plans that have been tried in this and other countries, especially in the training of secondary teachers. The hygiene of teaching. *Once a week, half a year.*

C. RECENT MOVEMENTS AND PRESENT PROBLEMS IN EDUCATION AND SCHOOL HYGIENE. This course will involve the discussion of special topics and problems of pedagogy, school hygiene, child study, and educational psychology. Topics like the following will be considered from the point of view of genetic psychology and of hygiene:—Correlation. Enrichment of the course of study. Grading. Doctrine of interest. Training of the will. Problems of organization and administration. Recent educational literature. *One hour a week, half a year.*

D. CONFERENCE. The work will be determined in part by the needs of the individual students. It is hoped that each student will select, after consultation with President Hall and Dr. Burnham, a topic for special investigation. The results of such studies may be published. *Once a week, throughout the year.*

PRESIDENT G. STANLEY HALL'S COURSE.

The Pedagogy and Psychology of the Topics of School Work, from the Kindergarten to the University. One hour weekly, Saturday mornings.

This and Dr. Burnham's Saturday work constitute a special course open to teachers as well as to members of the University.

The courses as announced above may be modified somewhat as the needs of the students or other circumstances may require.

The library of the department has a large collection of EDUCATIONAL LITERATURE, being especially rich in German and French literature, and having a large number of official reports from various countries—English, French, German, Belgian, Swedish, etc.; also town and city reports, and reports of special institutions; and a collection of French, German, and American text-books.

The books are arranged under the following heads:

1. GENERAL.
2. HISTORY OF EDUCATION.
3. EDUCATIONAL SYSTEMS.
4. THE THEORY OF EDUCATION AND SPECIAL SCHOOL SUBJECTS.
5. EDUCATIONAL PSYCHOLOGY.
6. CHILD STUDY.
7. SCHOOL HYGIENE AND PHYSICAL EDUCATION.
8. TEXT-BOOKS.
9. MISCELLANEOUS.

Many of the more common educational books are accessible in the Worcester Public Library and have not been duplicated by the University. The large collection of educational text-books in the library of the American Antiquarian Society and its valuable historical material are also accessible to the University.

The collection of educational periodicals includes a

large number of the best foreign journals—English, French, German, Swedish, etc.

The nucleus of an educational museum has been formed, which contains a valuable collection of EDUCATIONAL APPARATUS, pictures and other material for language lessons and *Anschauungsunterricht*, maps, charts, diagrams, models, illustrative material in school hygiene, etc.

The *Pedagogical Seminary* is a journal issued at the University, and serves as a convenient medium of publication for special investigation undertaken in the department.

SPECIAL STUDENTS IN EDUCATION.

In addition to the members of the University, special students are admitted during the year to the Saturday courses of Drs. Hall and Burnham in Education, for a fee of \$20.

VIII.

ECONOMICS AND SOCIOLOGY.

The degrees of Master of Arts and Doctor of Philosophy will be offered in this department both in Economics and in Sociology.

The degree of Master of Arts will be given both in Economics and in Sociology for the completion with credit of a course of study approved by the department. Such a course may be composed of a major in Economics and a minor in History, or of a major in Sociology and a minor in Psychology. The requirements, however, will be made sufficiently elastic to suit the needs of individual students.

For the degree of Doctor of Philosophy in either Economics or Sociology, all the courses offered by the department in both these subjects will form the major requirement. Students expecting to take the degree in Economics, however, are advised to do their minor work in History; and students expecting to take the degree in Sociology are advised to do their minor work in Biology, Anthropology, or Psychology. The minor work will constitute about one-third of the work required.

The ability of students to do satisfactory research work will always be considered the most important qualification for the Doctor's degree.

Within a period of three years all the following courses will be offered, with which the student may satisfy the major requirements for the Doctor's degree, and each year such courses will be given as the interests and needs of the students require.

1. Advanced Theory of Economics.
2. History of Economic Theory.
3. Theory and use of Statistics.
4. Labor Problems, including Labor Legislation.
5. Theory of Sociology. (See announcement in Collegiate Department.)
6. Literature of Sociology, including the leading theories of the present day.
7. Social Problems, including suicide, divorce, migration of population, fecundity of population, intemperance, pauperism, crime, etc.
8. History of the Theories of Socialism and Communism.
9. Scope and Method of the Social Sciences.
10. Seminary.

For the year 1905-1906 the following courses are offered.

BY PROFESSOR WRIGHT.

3. THEORY AND USE OF STATISTICS.

Population: Its composition; Immigration; Arrears, urban and rural; Births; Deaths; Marriages; Divorces.

Statistics of Crime: Pauperism; Benevolences, etc.

Statistics of Agriculture: Commerce; Finance.

Statistics of Manufactures: Capital; Products; Cost of production; Efficiency of labor; Labor cost, etc.

Wage Statistics: Difficulties attending them; Money wages; Real wages; Cost of living; Rates and earnings; Purchasing power of money.

4. LABOR PROBLEMS.

Under this general title the various features and elements of industrial society will be discussed, including Systems of labor; Evolution of manufactures; The factory system; The regulation of industry by states and individuals; Communism; Municipal socialism; Social democracy and state socialism; Strikes and lockouts; Industrial conciliation and arbitration; Government by injunction; Employers' liability and other features of the labor problem.

10. SEMINARY.

BY DR. BUSHEE.

5. **THEORY OF SOCIOLOGY.** (See announcement in Collegiate Department.)

And one or more of the following courses.

1. **ECONOMIC THEORY** during the 18th and 19th Centuries. The theories of the early economists will be studied with reference to the economic conditions under which they were formulated. The major part of the course, however, will be devoted to recent economic literature and to the present trend of economic thought. *2 hours.*

6. **LITERATURE OF SOCIOLOGY.** In this course a critical examination will be made of the contributions of the leading sociologists beginning with Auguste Comte, with reference both to their general theories and to their special contributions to the science of Sociology. Other authors to be studied will include Spencer, Ward, Giddings, Loria, De Greef, Gumpłowicz, Coste, Durkheim, Kidd, Tarde, and Simmel. This course presupposes a knowledge of the general principles of Sociology. Those who have not had such preparation may advantageously take the introductory course given in the Collegiate Department. *2 hours.*

8. **SOCIALISM AND COMMUNISM.** This course will consist in an historical survey of the theories of the leading Utopian and scientific Socialists and in a critical examination of the practical experiments in Communism which have been made in the United States and in foreign countries. Special attention will be given to the development of the three leading principles of scientific socialism, the materialistic conception of history, the theory of value, and the class-conscious struggle. These principles will be studied as represented by Marx, Engels, Kautsky, Bebel, Vandervelde, Labriola, Bernstein, Vollmar, Jaurès, and by the English Fabians. *2 hours.*

10. **SEMINARY IN ECONOMICS AND SOCIOLOGY.** Students entering the Seminary will be directed in research work in topics in Economics or in Sociology. Special subjects outside of the regular courses will be discussed and some of the periodic literature will be reviewed.

IX.

HISTORY.

The degree of Master of Arts may be obtained by graduate students who shall satisfactorily conclude a course of approved historical study, pursued in residence for a period of not less than one year. While the major part of the course must be taken in the department of history, it will be permissible to complete the minor requirement by work in another department.

The following courses will be offered by DR. BLAKESLEE in different years:

1. INTERNATIONAL LAW.

The aim of this course will be to give a knowledge of the general principles of International Law. So far as possible definite cases will be studied, and for that purpose Scott's "Cases on International Law" will be followed. Especial attention will be paid to the legal questions involved in the Russian-Japanese controversy; the incidents of the war will be used to illustrate the general principles of Belligerency and to point out recent modifications of former international usage. The study of leading authorities and cases will be supplemented by lectures, discussions and thesis work.

2. ENGLISH HISTORY—the Period of the Tudors and the Stuarts.

The course will extend from the accession of Henry VII, in 1485, to the death of Queen Anne, in 1714, and will deal especially with the establishment of practical absolutism under Henry VII and Henry VIII; the rise of Protestantism; the development of Puritanism in State and Church; the great Civil War; Cromwell and the Puritan ascendancy; the attempts to form a firm constitutional government; the relation of English Puritanism to that of Switzerland and New England; the restoration of monarchy; and the final triumph of Parliament in the overthrow of James II.

Original sources will be carefully studied. Students will be expected to read widely in the leading authorities and to form opinions of their own upon the many perplexing religious, political and constitutional questions of the period.

3. THE HISTORY OF THE CHRISTIAN CHURCH.

This course will give a general history of the Christian Church from the days of the Apostles up to the present time. The leading topics considered will be: the pre-Constantine church, including the persecution and the formation of a definite ecclesiastical organization; the effects upon the church of Constantine's conversion; the Nicene Creed and the early heresies; the conversion of the barbarians and its reflex action upon the church; Monasticism; the rise of the Papacy; the Mediæval Church at its height; the rise of heresy—Wyclif, Huss, Savonarola; the reformation—Luther, Zwingli, Calvin; the Catholic Reformation; the religious wars of the sixteenth and seventeenth centuries; the Puritans; and a survey of the history of the leading Protestant denominations. The purpose of the course will be to give a clear conception of the history of the church as a whole, not to deal in detail with any single period.

4. THE REFORMATION.

The causes of the revolt from the Mediæval Church System will first be carefully traced from the opening of the fourteenth century, after which the attempts of the church to reform itself from within will be studied in the great councils of the fifteenth century. The history of the years immediately following the publication of Luther's ninety-five theses will be treated in considerable detail. The interdependence of religious, political and economic conditions will be pointed out. The great religious leaders, Luther, Zwingli, Calvin, and Loyola will be compared and the permanent value of their work estimated. The course will end with the close of the Council of Trent in 1563. Extensive collateral reading will be expected in such Protestant and Catholic writers as Creighton, Ranke, Pastor and Janssen.

5. ECONOMIC HISTORY OF EUROPE.

The aim of the course will be to give a general account of the rise and development of the leading economic and social institutions of Europe. Some of the subjects considered will be: the

manor; the different systems of land holding; serfdom; the merchant and craft guilds; the domestic and factory systems of industry; town life and the Hanseatic League; the rise of commerce and the struggles for world commercial supremacy; and the economic importance of colonies. Especial attention will be paid to English conditions. This course will be of particular assistance to students electing in economics.

6. HISTORICAL SEMINAR.

Different subjects for this course may be taken in succeeding years. For 1905-06 the period studied will be the history of the United States from the Missouri Compromise to the outbreak of the Civil war, with especial emphasis upon the years following the compromise of 1850. The members of the Seminar will be expected to present reports upon topics assigned by the instructor; these reports will then form the basis for a critical discussion.

In 1905-06 courses 1 and 6 will probably be given.

X.

MODERN LANGUAGES.

DR. CAPEN offers the following courses leading to the degree of Master of Arts.

GERMAN.

SEMINARY ON THE GERMAN DRAMA. A consideration of the main epochs of the German Drama from the earliest Osterspiele down to the work of contemporary dramatists. Particular attention will be paid to the development of dramatic form and the work of the principal theorists.

LESSING AND SCHILLER. Their lives and principal writings. Lessing's critical works and Schiller's philosophical essays will receive special attention.

GERMAN LITERATURE IN THE NINETEENTH CENTURY. The novel, the drama and the lyric.

One of the above courses will be offered each year. In addition, courses 5, 6 and 8, the History of German Literature, Middle High German and Goethe and his Time, respectively, which are regularly offered in the Collegiate Department of German, will be open to graduate students.

FRENCH.

FRENCH LITERATURE IN THE EIGHTEENTH CENTURY. The decay of the tragedy; the "drame" and the "comédie larmoyante;" the novel and the philosophical essay.

FRENCH LITERATURE IN THE NINETEENTH CENTURY. The Romantic, Realistic and Naturalistic Movements. The development of lyric poetry, the novel and the drama.

One of these courses will be offered each year. Courses 4 and 5, the History of French Literature and French Literature in the Sixteenth Century, respectively, which are regularly offered in the Collegiate Department of French, will also be open to graduate students.

The candidate for the degree of Master of Arts who makes either German or French his major subject may make a minor of the other language, or, with the consent of the instructor, may take his minor work in another field.

The attention of students in other departments of the University is called to the following undergraduate courses.

SCIENTIFIC GERMAN. The aim of this course will be to aid students in scientific departments to acquire a fair reading knowledge of scientific German. The first part of the course will consist of a brief review of the forms and syntactical principles of the language, accompanied by the reading of some popular scientific works of general interest, such as Helmholtz's *Populäre Vorträge*, or Wagner's *Entwickelungslehre*. In the latter part of the course more specialized scientific reading in his own field will be assigned to each student, under the direction of the instructor. *Two hours a week.*

SCIENTIFIC FRENCH. Students of the University who desire to gain facility in reading scientific French may meet the instructor at stated periods for direction and assistance.

Students who have no knowledge of German or French may find it advisable to enter the elementary courses in those languages given in the Collegiate Department.

LIBRARY.

The Library is under the control of a Library Committee, appointed by the Trustees, of which the President of the University is *ex-officio* chairman. The duties of this Committee are to advise concerning the arrangement, cataloguing, use of books, and other matters pertaining to the Library not reserved to the Trustees or otherwise provided for.

LIBRARY COMMITTEE.

PRESIDENT G. STANLEY HALL, *Chairman*.

PRESIDENT CARROLL D. WRIGHT.

PROFESSOR WILLIAM E. STORY, *Secretary*.

LIBRARY STAFF.

LOUIS N. WILSON, *Librarian*.

Assistants.

EDITH M. BAKER,

ALICE M. PRENTICE,

ROY M. CUSHMAN,

MARY D. THURSTON,

ETHEL A. PENNELL.

MARY S. TERWILLIGER.

The Library building is situated on the corner of Main and Downing streets. The Public Opening of the new building was held January 14th, 1904. A full description of the building and of the Proceedings at the Opening will be found in the *Publications of the Clark University Library* for April, 1904 (Vol. 1, No. 3).

The College Library and study room is located in the room formerly occupied by the University Library in the Main Building.

The Library contains about 35,000 bound volumes

and 1,500 pamphlets, and the reading-room receives over 200 journals.

The books are grouped as follows:

| | | | |
|-----|--|---|-------------------------------|
| A | WORKS OF GENERAL REFERENCE. | I | PSYCHOLOGY. |
| B | JOURNALS. | J | PHILOSOPHY. |
| C | MATHEMATICS. | K | RELIGIOUS PSYCHOLOGY. |
| C D | MATH.-PHYSICS. | M | ANTHROPOLOGY. |
| D | PHYSICS. | N | EDUCATION. |
| E | CHEMISTRY. | P | HISTORY. |
| F | BIOLOGY, ZOÖLOGY, BOTANY, PHYSIOLOGY, NEUROLOGY. | R | POLITICAL AND SOCIAL SCIENCE. |
| H | PATHOLOGY. | S | ENGLISH. |
| | | T | MODERN LANGUAGES. |
| | | U | CLASSICS. |

Books not included under any of these subjects are grouped as Miscellaneous, and marked according to their case, tier and shelf. They comprise, in addition to Congressional publications, bound files of Magazines, several score of rare old books, a collection of art publications, travels, complete works, sets of reports, histories, etc.

The books in the Art Department are accessible on application to the librarian, but, by the terms of the Founder's will, they cannot be taken from the building.

All the privileges of the library are open to all members of the University, and each member has direct access to every book and journal.

The library is open from 8 A. M. to 6 P. M.

Outside the University are found:

The Library of the American Antiquarian Society, organized in 1812, and containing over 120,000 volumes, is accessible to all members of the University.

The Worcester Public Library containing 360 periodi-

cals and about 150,000 volumes, has, in the past, to some extent, supplemented the scientific publications purchased by the University, and all its privileges are accessible without charge.

The Library of the Worcester District Medical Society of over 10,000 volumes is also free to all members of the University.

LIBRARY RULES.

No loud talking is allowed in any part of the Library.

Every book shall be returned at the end of one calendar month from the time at which it was taken out, but may be called in at any time at the discretion of the Librarian.

Current numbers of periodicals shall not be taken out until they have been in the Library ten days.

All dictionaries, cyclopædiás, and books of general reference are permanently reserved.

Reserved books and current numbers of periodicals, exempt from circulation, may be taken out after 5.30 P. M., but must be returned before 9 o'clock the next morning, excepting that such books and periodicals may be taken out Saturdays at 12 o'clock M., and may be kept until 9 o'clock the next Monday morning.

Readers must not write or make any mark upon any book, manuscript, map, or other property belonging to the Library.

Any breach of the above Rules will involve suspension of the Library privileges until personally restored by the Librarian. All such cases shall be laid before the Library Committee at their next meeting.

ART DEPARTMENT.

In his last will and testament the Founder of the University bequeathed "the sum of \$100,000 as an endowment fund for the Art Department of said University, and said sum is to be held and kept sacred and intact as a principal not to be used or expended under any conditions, but the income, interest or proceeds thereof shall be used only in putting and keeping said works of art or others given or obtained for said department in good condition and in taking care of them; and then if there is a surplus of the income of said fund left, I will and direct that it be used in the purchase of additional works of art or of such matters as will add to the usefulness and efficiency of said Art Department." Under these conditions a large room has been furnished and equipped in the upper floor of the Library Building. Upon the death of Mrs. Clark, those of the Founder's collections that were deemed most suitable for this purpose were arranged and displayed in this room, together with his most valuable books, which, by the conditions of the will, cannot be removed from the building. The selection and arrangement of these books, pictures, and other objects was placed by action of the Board in the hands of Mr. John G. Heywood. A Curator and Custodian of them have been appointed by the Board (see page 89) and all are now accessible to visitors.

REGULATIONS.

1. All requisitions for apparatus must be made through the Bursar's office upon printed blanks provided for that purpose, and signed by a member of the staff.

2. So far as possible, orders for only the kind and amount of apparatus certain to be used during the year shall be placed; nothing shall be ordered for future years, and apparatus for research shall take precedence over that for teaching and illustration only.

3. Requisitions for repairs, furniture, plumbing and work about the buildings must be made through the Bursar's office in writing and with detail, and when once passed upon, no change involving additional expense can be made in the requisition without the consent of the Finance Committee.

4. No unappropriated rooms and no part of the University grounds shall be used for any purpose, and appropriated rooms shall not be used for other purposes than the stated University work for which they were intended, without previous permission from the office.

5. Unless for special reasons, absence of instructors from their stated exercises or from town for two consecutive week days, in term time, should be announced at the office, and for longer absence permission should be obtained beforehand.

6. The Trustees desire that no Instructor, Docent, or Fellow shall enter upon other engagements outside his proper work in the University of a kind or amount likely to lessen his full efficiency for science within the University.

The following additional rules were passed by the Board of Trustees, at a meeting held April 4th, 1891, to take effect for the next academic year.

7. Appropriations shall hereafter cover all apparatus and supplies of whatever nature for laboratories, for demonstration or illustration; all metal and carpenter work connected with the scientific activity of each department; and every form of special service. Appropriations, however, shall not hereafter cover books or journals, which shall be submitted to the Library Committee.

8. The several appropriations made to individual instructors and others shall be the full and fixed limit of the liability of the University, to be on no account transcended, and for every excess over the appropriations, from whatever cause, the instructor making the order shall be personally responsible.

9. No order for any purpose shall be paid by the University, whether on appropriations or for general supplies, that has not passed through the Bursar's office.

At a meeting of the Board of Trustees, held January 17, 1905, the following additional rules were enacted:

10. The President, Professors, Assistant Professors and regular Instructors authorized by the Board to do graduate work, together with the Librarian, shall constitute the Faculty of the University. Its meetings shall be called and presided over by its President or, in his absence, by a Professor whom he shall designate. The Faculty shall elect a Secretary and its records shall always be accessible to the Trustees. Its jurisdiction shall include all matters pertaining to the instruction, conduct and discipline of students, and such other duties as may be prescribed by the Trustees.

11. The President of the University shall make at the October meeting an annual report on the condition of the departments and their work during the year and shall have authority to require and receive from all instructors and officers of the University and Library such reports as he may deem necessary. A copy of these reports, including that of the Library, shall be deposited with the Mayor of the City.

12. The University Faculty shall have the oversight of all graduate work and shall recommend for the Master's, Doctor's and all other graduate degrees upon such terms, conditions, and forms as it may determine, and exercise such other functions and responsibilities as are not expressly assigned to the Trustees or to the Collegiate Department.

13. The Custodian of the Art Collections shall have general oversight over its room in the Library Building and its contents, together with their care and use, under the direction and control of the Curator. The Curator shall from time to time submit to the Trustees his recommendations for the purchase of additional works of art from the income of the Art Fund, based on and together with the opinions of experts as to their value and desirability. All such purchases shall be approved by the Board of Trustees, or by such a committee of their members as they shall appoint for that purpose.

14. The President of the University shall make an annual report to the Trustees of the action of the Library Committee, of which he is Chairman, and this report if approved shall be filed and preserved.

DEGREES CONFERRED.

Since the publication of the Sixteenth Official Announcement, the Degree of Doctor of Philosophy has been conferred upon the gentlemen whose names appear below.

DOCTORS OF PHILOSOPHY.

LONNA DENNIS ARNETT, June 15, 1903.

Dissertation: The Soul. A Study of Past and Present Beliefs.

American Journal of Psychology, April and July, 1904, Vol. 15, pp. 121-200; 347-382.

EDWARD CONRADI, June 23, 1904.

Dissertation: Psychology and Pathology of Speech Development of the Child.

Pedagogical Seminary, September, 1904, Vol. 11, pp. 327-380.

FRED KUHLMANN, June 17, 1903.

Dissertation: Experimental Studies in Mental Deficiency: Three cases of Imbecility (Mongolian) and Six Cases of Feeble-Mindedness.

American Journal of Psychology, July, 1904, Vol. 15, pp. 391-446.

AUGUSTUS W. TRETTIEN, June 1, 1904.

Dissertation: Psychology of the Language Interest of Children.

Pedagogical Seminary, June, 1904, Vol. 11, pp. 113-117.

The following gentlemen also have taken the examination for the doctor's degree, but have not yet completed all the formal requirements.

EUGENE W. BOHANNON,
CHARLES E. BROWNE,
W. FOWLER BUCKE,
ARTHUR L. CLARK,
JOSEPH GEORGE COFFIN,
A. CASWELL ELLIS,

JESSE NEVIN GATES,
JOHN CHARLES HUBBARD,
HERBERT G. KEPPEL,
MELANCHTHON F. LIBBY,
JOSIAH MOSES,
FRED MUTCHLER,

ROY T. WELLS.

PUBLICATIONS RELATING TO THE UNIVERSITY.

A Register and Official Announcement is issued each year in February or March.

In the years 1890, 91, 92, and 1903, the annual Report of the President to the Board of Trustees was printed.

A Summer School has been held each year since 1892, with the exception of 1893, 1900, 1902 and 1904, and in such years a Summer School Programme has been issued.

In July, 1899, the University observed its tenth anniversary, and published the following volume:

Clark University, 1889-1899. Decennial Celebration, 8 x 11 in., pp. 566. Published for the University. Price, \$5.00. Contains the lectures delivered by Professors Picard, Boltzmann, Cajal, Mosso and Forel at the Decennial Celebration, July, 1899; also reports by the heads of departments on their aims and ideals, with a list of past and present members of the University and the titles of their published papers.

JOURNALS CONNECTED UNOFFICIALLY WITH THE DEPARTMENTS.

THE AMERICAN JOURNAL OF PSYCHOLOGY. This Journal was commenced in November, 1887, and is now edited by G. Stanley Hall, E. C. Sanford, and E. B. Titchener (Cornell University) with the assistance of an international board of co-operators. Each volume contains four numbers of about 150 pages each. Besides original articles, a considerable portion of its space is devoted to careful digests of the important literature in

its field. Price, \$5 per volume; single numbers, \$1.50. Louis N. Wilson, Publisher, Worcester, Mass.

THE PEDAGOGICAL SEMINARY. This Journal was begun in January, 1891, and is edited by the President of the University. It is an international record of educational literature, institutions and progress, and is devoted solely to the highest interest of education in all grades, with digests of important literature of all countries. It is the organ of the Educational Department of the University. Each volume contains from 400 to 500 pages. Price, of Vols. 4, 5 and 6, \$6 each. Later Volumes \$5 each. Price of Vols, 1, 2 and 3 on application. Louis N. Wilson, Publisher, Worcester, Mass.

THE MATHEMATICAL REVIEW. This journal, of which the first volume is in course of publication, is edited by William E. Story. Its scope includes original research in mathematics, résumés of subjects of a more elementary character, pedagogical and historical sketches, and bibliographical notices. Every volume will consist of six numbers of 96 pages each. Each number contains the portrait of some distinguished mathematician. Price, \$5 a volume. Published by the editor, Worcester, Mass.

THE AMERICAN JOURNAL OF RELIGIOUS PSYCHOLOGY AND EDUCATION. This journal was begun in May, 1904, and appears three times a year. It aims to give an account of all the more important books and periodicals in its field, which includes religious education, and prints original articles. Each number contains about 100 pages. Price, \$3.50 per volume, \$1.50 per number. Louis N. Wilson, Publisher, Worcester, Mass.



Clark University
in the City of Worcester
Massachusetts

Register and
Eighteenth Official
Announcement

1906

BOARD OF TRUSTEES.

STEPHEN SALISBURY,*

EDWARD COWLES,

THOMAS H. GAGE,

CHARLES H. CLARK,

ROCKWOOD HOAR,

A. GEORGE BULLOCK,

ORLANDO W. NORCROSS,

FRANCIS H. DEWEY,

ARTHUR F. ESTABROOK.

*Deceased, November 16, 1905.

CLARK UNIVERSITY

WORCESTER, MASS.

REGISTER

AND

Eighteenth Official Announcement

WORCESTER, MASS.

PUBLISHED FOR THE UNIVERSITY

February, 1906

CALENDAR, 1906-1907.

1906.

| | | | |
|-------|-----|------------|--------------------------------------|
| APRIL | 2. | Monday, | } Spring Recess. |
| APRIL | 7. | Saturday, | |
| APRIL | 19. | Thursday, | Patriots' Day. |
| MAY | 30. | Wednesday, | Memorial Day. |
| JUNE | 21. | Thursday, | Seventeenth academic year closes. |

Summer Vacation of 14 Weeks.

| | | |
|-----------|------------|-------------------------------------|
| SEPT. 27. | Thursday, | Eighteenth academic year begins. |
| NOV. 29. | Thursday, | Thanksgiving Day. |
| DEC. 24. | Monday, | } Christmas Recess. |
| 1907. | | |
| JAN. 2. | Wednesday, | |
| FEB. 1. | Friday, | Founder's Day.* |
| FEB. 22. | Friday, | Washington's Birthday. |
| APRIL 1. | Monday, | } Spring Recess. |
| APRIL 6. | Saturday, | |
| APRIL 19. | Friday, | Patriots' Day. |
| MAY 30. | Thursday, | Memorial Day. |
| JUNE 20. | Thursday, | Eighteenth academic year closes. |

* Not a holiday.

MEMBERS.

STAFF.

G. STANLEY HALL, PH. D., LL. D., 94 Woodland St.
President of the University, Professor of Psychology, and
Curator of the Art Collection.

A. B., Williams College, 1867, and A. M., 1870; Ph. D., Harvard University, 1878; Lecturer in Harvard and Williams Colleges, 1880-81; Professor of Psychology, Johns Hopkins University, 1881-88; LL. D., University of Michigan, 1888, Williams College, 1889, and Johns Hopkins University, 1902. Resident member of the Massachusetts Historical Society.

WILLIAM E. STORY, PH. D., 17 Hammond St.
Professor of Mathematics.

A. B., Harvard University, 1871; Ph. D., Leipzig, 1875; Parker Fellow (Harvard), 1874-75; Tutor of Mathematics, Harvard University, 1875-76; Associate, Assistant Professor, and Associate Professor of Mathematics, Johns Hopkins University, 1876-89. Member of the London Mathematical Society; Resident Fellow of the American Academy of Arts and Sciences.

EDMUND C. SANFORD, PH. D., 24 Richards St.
Professor of Experimental and Comparative Psychology.

A. B., University of California, 1883; Fellow, Johns Hopkins University, 1887; Ph. D., Johns Hopkins University, 1888; Instructor in Psychology, Johns Hopkins University, 1888; Instructor in Psychology, Clark University, 1889-92; Assistant Professor, 1892-1900.

ARTHUR G. WEBSTER, PH. D., D. SC., 66 West St.
Professor of Physics.

A. B., Harvard University, 1885; Instructor in Mathematics, Harvard University, 1885-86; Parker Fellow, 1886-89; Student, Universities of Berlin, Paris, Stockholm, 1885-90; Ph. D., Berlin, 1890; Docent in Physics, Clark University, 1890-92; Assistant Professor, 1892-1900; D. Sc., Tufts College, 1905. Member National Academy of Sciences; Resident Fellow of the American Academy of Arts and Sciences.

HENRY TABER,* PH. D., 65 West St.
Professor of Mathematics.

Ph. B., Yale University, 1882; Ph. D., Johns Hopkins University, 1888; Assistant in Mathematics, Johns Hopkins University, 1888-89; Docent in Mathematics, Clark University, 1889-92; Assistant Professor, 1892-1903. Member of the London Mathematical Society; Resident Fellow of the American Academy of Arts and Sciences.

CARROLL D. WRIGHT, PH. D., LL. D., 96 Woodland St.
Professor of Statistics and Social Economics.

President, Collegiate Department, 1902-.

* On leave of absence, 1905-06.

CLIFTON F. HODGE, PH. D., 3 Charlotte St.
Assistant Professor of Physiology and Neurology.

A. B., Ripon College, 1882; Fellow in Biology, Johns Hopkins University, 1888-89; Ph. D., Johns Hopkins University, 1889; Fellow in Psychology, and Assistant in Neurology, Clark University, 1889-91; Instructor in Biology, University of Wisconsin, 1891-92.

WILLIAM H. BURNHAM, PH. D., 100 Chatham St.
Assistant Professor of Pedagogy.

A. B., Harvard University, 1882; Instructor in Wittenberg College, 1882-83; Instructor in the State Normal School, Potsdam, N. Y., 1883-85; Fellow, Johns Hopkins University, 1885-86; Ph. D., 1888, and Instructor in Psychology, 1888-89; Docent in Pedagogy, Clark University, 1890-92; Instructor, 1892-1900.

ALEXANDER F. CHAMBERLAIN, PH. D., 12 Shirley St.
Assistant Professor of Anthropology.

B. A. (1886), M. A. (1889), University of Toronto; Fellow in Modern Languages, University College, Toronto, 1887-90; Librarian, Canadian Institute, Toronto, 1889-90; Fellow in Anthropology, Clark University, 1890-92; Ph. D., Clark University, 1892; Lecturer in Anthropology, Clark University, 1892-1900; Acting Assistant Professor, 1900-04; Associate Editor, *American Antiquarian*; Editor, *Journal of American Folk-Lore*; Corresponding Member, O Instituto de Coimbra, Portugal; Member of the American Antiquarian Society.

JOSEPH DE PEROTT, 5 Gates St.
Lecturer in Mathematics.

Student, Universities of Paris and Berlin, 1877-80.

SAMUEL P. CAPEN, PH. D., 940 Main St.
Instructor in Modern Languages.

A. B., A. M., Tufts College, 1898; A. M., Harvard, 1900; Harrison Fellow in Germanic Languages at University of Pennsylvania, 1900-1901; Student at University of Leipzig, 1901-02; Ph. D., University of Pennsylvania, 1902; Instructor in Modern Languages, Collegiate Department, 1902-03; Assistant Professor, 1903-.

FREDERICK A. BUSHEE, PH. D., 45 Hollywood St.
Instructor in Economics and Sociology.

Litt. B., Dartmouth, 1894; A. M., Harvard, 1898; Ph. D., Harvard, 1902; Resident South End House, Boston, 1894-95, 1896-97; Hartford School of Sociology, 1895-96; Harvard University, 1897-1900; Collège Libre des Sciences Sociales, Collège de France, Paris, University of Berlin, 1900-01; Assistant in Economics, Harvard University, 1901-02; Instructor in Economics and History, Collegiate Department, 1902-03; Assistant Professor of Economics, 1903-.

BENJAMIN S. MERIGOLD, PH. D., 59 Chatham St.
Instructor in Chemistry.

A. B., Harvard University, 1896; A. M., 1897; Ph. D., 1901; Assistant in Chemistry, Harvard, 1896-1900; Instructor in Chemistry, Worcester Polytechnic Institute, 1900-1903; Assistant Professor of Chemistry, Collegiate Department, 1903-.

GEORGE H. BLAKESLEE, PH. D., 940 Main St.
Instructor in History.

A. B., Wesleyan, 1893; A. M., Harvard, 1899; Ph. D., Harvard, 1903; Student, Johns Hopkins University, 1893-94; Parker Fellow, Harvard, 1901-02; Student, Universities of Berlin, Leipzig, and Oxford, 1901-03; Instructor in History, Collegiate Department, 1903-04; Assistant Professor, 1904- .

PRENTISS C. HOYT, PH. D., 940 Main St.
Instructor in English.

A. B., Middlebury College, 1889; A. M., 1892; A. M., Harvard University, 1899; Ph. D., 1902; Instructor, 1902-04; Assistant Professor of English, Collegiate Department, Clark University, 1904- .

LOUIS N. WILSON, Litt. D., '11 Shirley St.
Librarian of the University and Custodian of the Art Collection.

A. B., Clark University, 1905; Litt. D., Tufts College, 1905.

ANNUAL APPOINTMENTS.

REGINALD BRYANT ALLEN, PH. D., Medford, N. J.
Instructor in Mathematics. 8 Loudon St.

B. S., Rutgers College, 1893; M. S., 1897; Acting Professor of Mathematics. Massachusetts Agricultural College, 1895; Instructor and Assistant Professor of Mathematics, Adelphi College, Brooklyn, N. Y., 1887-1901; Scholar, Clark University, 1901-02; Fellow, 1902-03, 1904-05; Ph. D., *ibid*, 1905.

EDWARD COWLES, M. D., LL. D., Boston, Mass.
Non-Resident Lecturer on Psychiatry.

A. B., Dartmouth College, 1859; A. M., 1863; Medical House Pupil, Retreat for the Insane, Hartford, Conn.; 1860-62; M. D., Dartmouth Medical School, 1863; M. D., College of Physicians and Surgeons, New York, 1863; Medical Corps, United States Army, 1863-72; Resident Physician and Superintendent, Boston City Hospital, 1872-79; Medical Superintendent, McLean Hospital, Waverley, Mass., 1879-1903. Lecturer on Mental Diseases, Dartmouth Medical School, 1885-86; Professor of Mental Diseases, *ibid.*, 1886-; Fellow by Courtesy, Johns Hopkins University, 1887-88; Clinical Instructor in Mental Diseases, Harvard Medical School, 1888-; LL. D., Dartmouth College, 1890.

GEORGE E. PARTRIDGE, PH. D., 54 Hollywood St.
Docent in Psychology.

Special Student in Philosophy, Clark University, 1895-96; Scholar, 1896-98; Honorary Fellow, 1899-1900; Ph. D., Clark University, 1899; Professor of Psychology, State Normal School, Mankato, Minn., 1900-04; Lecturer in Psychology, Clark University, 1904-05.

HONORARY FELLOWS.

FRANK K. BAILEY., B. S., 6 Downing St.
Honorary Fellow in Physics.

B. S., Colorado College, 1898; Scholar in Physics, Clark University, 1898-99; Fellow, 1899-1901; Assistant, Allegheny Observatory, 1901-04; Honorary Fellow in Physics, Clark University, 1904-05; Assistant in Physics, Collegiate Department, Clark University, 1904- .

RUFUS C. BENTLEY, A. M., 7 Downing St.
Honorary Fellow in Pedagogy.

A. B., University of Nebraska, 1894; A. M., 1896; Assistant in Psychology, University of Nebraska, 1893-96; Fellow in Education, Teachers College, Columbia University, 1900-01; Fellow in Pedagogy, Clark University, 1901-03; Honorary Fellow, 1903-05; Professor of Latin and Dean of the Faculty, Collegiate Department, Clark University, 1902-03; Professor of Pedagogy and Dean of the Faculty, 1903-

ALVIN BORGQUIST, B. S., 800 Main St.
Research Assistant to Dr. Sanford.

B. S., University of Utah, and Graduate, State Normal School, Utah, 1897; Graduate Student, Leland Stanford, Jr., University, Jan., 1898-May, 1903; Graduate Student, University of California, 1903-04; Fellow in Psychology, Clark University, 1904-05.

JOSEPH G. COFFIN, PH. D., 70 Florence St.
Honorary Fellow in Physics.

Student, Collège Chaptal, Paris, 1892-94; B. S., Massachusetts Institute of Technology, 1898; Assistant to Prof. Cross, Massachusetts Institute of Technology, 1898-1900; Scholar in Physics, Clark University, 1900-01; Fellow and Assistant, 1901-02; Fellow, 1902-03; Honorary Fellow, 1903-05; Ph. D., Clark University, 1905; Instructor in Physics, Collegiate Department, Clark University, 1902-05; Assistant Professor, 1905-

U. WALDO CUTLER, B. S., 63 Lancaster St.
Honorary Fellow in Psychology.

B. S., Worcester Polytechnic Institute, 1874; Student at Leipzig, Göttingen and Geneva Universities, 1879-1881; Instructor in Modern Languages, Worcester Polytechnic Institute, 1881-92; Professor, 1892-1903; Student at Johns Hopkins University, 1889.

JEAN DAWSON, PH. D., Ann Arbor, Mich., 3 Charlotte St.
Honorary Fellow in Biology.

Graduate, State Normal College, Ypsilanti, Mich., 1896; A. B., University of Michigan, 1902; A. M., 1903; Ph. D., 1905; Assistant in Biology, *ibid.*, 1903-04.

SAMUEL H. DODSON, PH. M., 23 Maywood St.
Honorary Fellow in Psychology.

Ph. B., Ph. M., Syracuse University, 1900; Professor of Method in History State Normal School, Jamaica, N. Y., 1900-02.

BERTHA C. DOWNING, M. D., Lexington, Mass., 5 Charlotte St.
Honorary Fellow in Psychology and Biology.

Harvard Annex, 1884; M. D., Woman's Medical College of Pennsylvania, 1896; Member of Clinical Staff New England Hospital, Roxbury, 1900-03; Member of New England Hospital Medical Society; Fellow of the Alumnae Ass'n of the Woman's Medical College of Pennsylvania, 1905-06.

S. B. HASLETT, PH. D., 4 Crown St.
Honorary Fellow in Psychology.

Graduate of the Edinboro (Pa.) State Normal School, 1883; A. B., Grove City College, Pa., 1889; A. M., 1896; Graduate, Allegheny Theological Seminary, 1892; Scholar in Psychology, Clark University, 1898-1900; Fellow, 1900-01; Ph. D., Clark University, 1901; Professor of Psychology and Education, Bible Normal College, Hartford, Conn., and Lecturer in Hartford Theological Seminary, 1901-02; Honorary Fellow in Psychology, Clark University, 1902-05.

FREDERICK H. HODGE, A. M., 919 Main St.
Honorary Fellow in Mathematics.

A. B., Boston University, 1894; A. M., 1899; Special Student, Mass. Normal School, Bridgewater, 1894-95; Professor of Mathematics, John B. Stetson University, 1895-96; Graduate Student in Mathematics, University of Chicago, 1896-97; Scholar in Mathematics, Clark University, 1897-98; Fellow 1898-99, 1901-03; Honorary Fellow, 1903-05; Professor of Mathematics and History, Bethel College, 1899-1901; Instructor in Mathematics, Collegiate Department, Clark University, 1902-05; Assistant Professor, 1905-

FRED MUTCHLER, PH. D., Terre Haute, Ind., 8 Lowell St.
Honorary Fellow in Biology.

A. B., Indiana University, 1902; Scholar in Biology, Clark University, 1902-03; Fellow, 1903-04; Hon. Fellow, 1904-05; Ph. D., Clark University, 1905; Instructor in Botany, Collegiate Department, Clark University, 1902-; Professor of Biology, Conn. State Agricultural College, 1904-05.

JAMES P. PORTER, A. M., 938 Main St.
Honorary Fellow in Psychology.

A. B., Indiana University, 1898; A. M., 1901; Student, Indiana State Normal School, 1890-91, 1892-93; Instructor in Psychology, Indiana University, 1900-03; In charge of work in Neurology, Indiana University Biological Station, 1901 and 1903; Honorary Fellow in Psychology, Clark University, 1903-05; Instructor in Psychology, Collegiate Department, Clark University, 1903-

JONATHAN RIGDON, PH. D., 28 Downing St.
Honorary Fellow in Psychology.

A. B., Central Normal College, Ind., 1885; A. B., Boston University, 1891; Instructor in Psychology and Philosophy, Central Normal College, 1895-1903; President, *ibid.*, 1900-1903; Hon. Fellow in Psychology, Clark University, 1904-05; Ph. D., Boston University, 1905; Assistant in the History of Philosophy and Ethics, Collegiate Department, Clark University, 1905-

RURIC NEVEL ROARK, PH. D., Lexington, Ky., 12 Wyman St.
Honorary Fellow in Psychology.

A. B., Normal University, Lebanon, Ohio, 1880; Professor of Natural Science, *ibid.*, 1880-85; Principal of Normal School, Glasgow, Ky., 1885-1889; Ph. D., Normal University, 1896; Dean, Dept. of Pedagogy, Kentucky State College, 1889-1905.

W. F. ROBIE, M. D., Baldwinville, Mass.
Honorary Fellow in Psychology and Biology.

A. B., Dartmouth College, 1889; M. D., Dartmouth Medical School, 1893; Assistant Physician, Hospital Cottages, 1892-94; Supt. Riverview Sanitarium, 1902-; Student in Psychology and Biology, Clark University, 1904-05.

THEODATE L. SMITH, PH. D., 23 Maywood St.
Research Assistant to Dr. Hall.

A. B., Smith College, 1882; A. M., 1884; Yale University, 1893-95; Special Student, Clark University, 1895-96; Ph. D., Yale, 1896; Cornell University, 1900; Assistant to President Hall in research work under Carnegie Grant, Clark University, 1902-04; Estabrook Grant, Oct., 1904-Feb.-05; Berlin University, April-Aug.-1905.

MYRON W. STICKNEY, A. M., 28 Freeland St.
Honorary Fellow in Biology.

A. B., Bates College, 1893; A. M., Brown University, 1895; Graduate Student, Brown University, 1896-97; Fellow in Biology, Clark University, 1900-01; Honorary Fellow, 1903-05.

MILLETT TAYLOR THOMPSON, PH. D., 23 Maywood St.
Honorary Fellow in Morphology.

A. B., Brown University, 1898; Ph. D., 1902; Fellow in Biology, Clark University, 1902-03; Honorary Fellow, 1903-05; Instructor in Zoölogy, Collegiate Department, Clark University, 1902- .

FELLOWS AND SCHOLARS.

ALBERT H. N. BARON, B. A., Silver Plume, Colo.,
Fellow in Psychology. 7 Downing St.

B. A., University of Colorado, 1904; Assistant in English, *ibid.*, 1903-04.

WILLIAM FREDERICK BOOK, A. B., Princeton, Ind.,
Fellow in Psychology. 44 May St.

A. B., Indiana University, 1900; Fellow in Psychology, Clark University, 1903-05; Professor of Philosophy and Education, University of Montana, Feb., 1905- .

ALFRED A. CLEVELAND, A. M., Astoria, Oregon,
Fellow in Psychology. 24 Beaver St.

A. B., University of Oregon, 1898; A. M., 1903; Fellow in Pedagogy, Clark University, 1903-05.

ERNEST WILLIAM COFFIN, B. A., Charlottetown, P. E. I.,
Fellow in Psychology. 4 Grand St.

B. A., Dalhousie University, 1902.

WILLIAM F. COPELAND, PH. M., Uhrichsville, Ohio,
Fellow in Biology. 1 Kilby St.

Ph. B., Ohio University, 1902; Ph. M., 1903; Assistant in Biology and Geology, *ibid.*, 1902-05.

ORIS P. DELLINGER, A. B., Bicknell, Ind., 3 Charlotte St.
Fellow in Biology.

Graduate, Indiana State Normal School, 1900; Student, University of Chicago, 1900-01; Assistant in Biology, Indiana State Normal School, 1901-03; A. B., Indiana University, 1904; Fellow in Biology, Clark University, 1904-05; Assistant in Biology, Collegiate Department, Clark University, 1904- .

FREDERICK N. DUNCAN, A. M., Flat Rock, Ill.,
Fellow in Biology. 28 Downing St.

A. B., Indiana University, 1900; A. M., 1901; Assistant in Chemistry, *ibid.*, 1900-01; Professor of Chemistry, Southwestern University, Georgetown, Texas, 1901-02; Professor of Biology, Emory College, 1902-03; Professor of Chemistry, *ibid.*, 1903-05.

ARNOLD LUCIUS GESELL, PH. B., Alma, Wis.,
Fellow in Pedagogy. 70 Florence St.

Graduate, Stevens Point (Wis.) Normal School, 1899; Ph. B., University of Wisconsin, 1903; Fellow in Pedagogy, Clark University, 1904-05.

DAVID GIBBS, S. B., Idell, N. J.,
Fellow in Biology. 46 Florence St.

Graduate, State Normal School, Trenton, N. J., 1892; S. B., Harvard University, 1898; Graduate Student, *ibid.*, 1898-99; Fellow in Pedagogy, Clark University, 1902-03, 1904-05.

DAVID SPENCE HILL, A. B., St. Louis, Mo., 44 May St.
Fellow in Psychology.

Student, Central College, Mo., 1889-1890; A. B., Randolph-Macon College, 1897.

JAMES RALPH JEWELL, A. M., Moran, Kansas,
Fellow in Psychology. 70 Florence St.

A. B., Coe College, 1903; A. M., 1905; Assistant in Psychology, Coe College, 1902-03; Fellow in Psychology, Clark University, 1903-05.

DAVID KELLY, M. A., Seattle, Wash., 17 Oread Place.
Fellow in Physics.

B. S., University of Washington, 1899; M. A., 1901; Tutor in Physics, University of Washington, 1899-1901; Assistant Professor of Physics, 1901-03; Scholar in Physics, Clark University, 1903-04; Fellow, 1904-05.

TOSHI-YASU KUMA, A. B., Tokio, Japan, 87 Woodland St.
Fellow in Psychology.

A. B., Stanford University, 1903; Fellow in Psychology, Clark University, 1903-05.

OLAF K. LIE, Kongsberg, Norway, 45 Woodland St.
Fellow in Mathematics.

Graduate, Cadet-School, Kristiania, 1884.

THOMAS SCOTT LOWDEN, PH. D., 42 Richards St.
Fellow in Psychology.

Student, Glasgow (Ky.) Normal School, 1887-89; Instructor in English, *ibid.*, 1888-89; A. B., Thiel College, 1893; A. M., and Ph. D., University of Wooster, 1895; Dean of Eastern Indiana Normal School and Professor of Philosophy and Education, 1899-1901; Professor of Pedagogy, De Pauw University, 1901-04; Fellow in Psychology, Clark University, 1904-05; Ph. D., *ibid.*, 1905.

TADASU MISAWA, Takanabe, Japan, 23 Maywood St.
Fellow in Psychology.

Graduate, Tokio Imperial University, 1904.

GEORGE EDMUND MYERS, A. M., Colorado Springs, Col.,
Fellow in Pedagogy. 32 Clifton St.

A. B., Ottawa University, Ottawa, Kansas, 1896; Student in Mathematics, University of Chicago, 1899-1901; A. M., *ibid.*, 1901; Fellow in Pedagogy, Clark University, 1904-05.

CAROLINE A. OSBORNE, M. D., 87 Woodland St.
Fellow in Biology.

M. D., Women's Medical College of Pennsylvania, 1899; Superintendent of Nurses, Memorial Hospital, Worcester, Mass., 1899-1904; Instructor of Nurses, *ibid.*, 1904-; Student in Biology, Clark University, 1901-05.

CHARLES EDGAR REBER, PH. D., Shippensburg, Pa.,
Fellow in Psychology. 28 Downing St.

A. B., Ursinus College, 1893; A. M., 1895; Ph. D., Wooster University, 1897; Graduate Student in English, Harvard, 1897-98; Graduate Student, University of Pennsylvania, 1899-1901; Instructor, State Normal School, Slippery Rock, Pa., 1895-97; Professor, Ursinus College, 1898-99; Head of Dept. of Pedagogy and Psychology, Angola, Ind., Normal College, 1901-03; Instructor in Psychology, State Normal School, Shippensburg, Pa., 1903-04; Fellow in Psychology, Clark University, Oct., 1904-Feb.-05.

JAMES T. ROOD, B. S., 30 John St.
Fellow in Physics.

B. S., Worcester Polytechnic Institute, 1898; Scholar in Physics, Clark University, 1903-04; Fellow, 1904-05.

ANNA A. SCHRYVER, A. B., Ann Arbor, Mich., 3 Charlotte St.
Fellow in Biology.

Instructor in Science Department, Teachers College, Columbia University, 1892-94; Assistant Professor, *ibid.*, 1894-95; In charge of Botany, Michigan State Normal College, 1895-1900; A. B., University of Michigan, 1903; Student in Psychology and Pedagogy, Clark University, 1903-04; Fellow in Biology, 1904-05.

GEORGE E. STEBBINS, A. B., Shelburne Falls, Mass., 27 Downing St.
Fellow in Physics.

A. B., Bates College, 1903; Assistant in Physics, Bates College, 1903-04; Scholar in Physics, Clark University, 1904-05.

WILLIAM E. STORY, JR., A. B., 17 Hammond St.
Fellow in Physics.

A. B., Harvard University, 1904; Scholar in Physics, Clark University, 1904-05.

LLOYD A. H. WARREN, M. A., Balderson, Canada, 8 Loudon St.
Fellow in Mathematics.

M. A., Queen's University, Kingston, Canada, 1902; Tutor in Mathematics, *ibid.*, 1902-04; Fellow in Mathematics, Clark University, 1904-05; Assistant in Mathematics, Collegiate Department, Clark University, 1905.

ROBERT IRVING BRAMHALL, A. B., 10 Dewey St.
Scholar in History.

A. B., Collegiate Department, Clark University, 1905.

FREDERICK NORTON COOKE, JR., A. B., 5 Lagrange St.
Scholar in Economics.

A. B., Collegiate Department, Clark University, 1905.

CHARLES E. DISNEY, A. B., 31 Edwards St.
Scholar in Biology.

A. B., Collegiate Department, Clark University, 1905.

GEORGE LEONARD DROWNE, PH. B., Providence, R. I., 10 Sycamore St.
Scholar in English.

Ph. B., Brown University, 1898.

ARTHUR H. ESTABROOK, A. B., Leicester, Mass.,
Scholar in Biology.

A. B., Collegiate Department, Clark University, 1905.

BURTON N. GATES, A. B., 10 Charlotte St.
Scholar in Biology.

A. B., Collegiate Department, Clark University, 1905.

ELMER A. HARRINGTON, A. B., Winchendon, Mass., 44 May St.
Scholar in Physics.

A. B., Collegiate Department, Clark University, 1905.

- J. WILLIAM HARRIS, A. B., Lexington, Ky.,
 Scholar in Psychology. 70 Florence St.
 A. B., Union College, Barbourville, Ky., 1901.
- EUCLID HÉLIE, A. B., Grande Ligne, Quebec,
 Scholar in Psychology. 11½ Fairfield St.
 A. B., McMaster University, Toronto, Canada, 1905.
- THOMAS F. KANE,
 Scholar in Modern Languages. 517 Southbridge St.
 A. B., Holy Cross College, 1905.
- WILLIAM HAROLD KEITH, A. B., 24 Beaver St.
 Scholar in History.
 A. B., Collegiate Department, Clark University, 1905.
- C. ALLAN LYFORD, B. S., 676 Pleasant St.
 Scholar in Chemistry.
 B. S., Worcester Polytechnic Institute, 1903; Fellow in Biology, Clark University, 1903-05; Assistant in Biology and Chemistry, Collegiate Department, Clark University, 1904-05; Assistant in Chemistry, 1905-
- MAURICE WALTER MEYERHARDT, 5 Clayton St.
 Scholar in Psychology.
 Student at Koellnisches Gymnasium, Berlin, seven years; Special Student in Psychology, Clark University, 1903-04; Scholar, 1904-05.
- HERBERT POOLE, 24½ Florence St.
 Scholar in Pedagogy.
 Graduate, State Normal School, Castine, Me., 1897.
- J. ADAMS PUFFER, B. A., Gardner, Mass.,
 Scholar in Pedagogy.
 B. A., Wesleyan University, 1896; S. T. B., Boston University, 1900.
- PUDUR RAJARATNAM, B. A., Madras, India,
 Scholar in Physics. 18 Clifton St.
 B. A., Madras University, 1891; Post-Graduate Student, Madras Christian College, 1891-93; Student, London University, 1903-04.
- HARRY SCHÜRMANN, A. B., 40 Chatham St.
 Scholar in Modern Languages.
 A. B., Collegiate Department, Clark University, 1905.
- HERMON L. SLOBIN, A. B., 3 Blake St.
 Scholar in Mathematics.
 A. B., Collegiate Department, Clark University, 1905.
- JAMES ALEXANDER THOMS, PH. D., Tyngsboro, Mass.,
 Scholar in Psychology. 27 Downing St.
 Ph. D., Garfield University, 1889; B. D., Rochester Theological Seminary, 1892; Scholar in Philosophy and Sociology, University of Chicago, 1893-94; Tutor in History, *ibid.*, 1893.
- REGINALD L. WEBB, A. B., Swampscott, Mass.,
 Scholar in English. 80 Woodland St.
 A. B., Collegiate Department, Clark University, 1905.

SPECIAL STUDENTS.

- JOHN M. BEMIS, M. D., 223 Salisbury St.
Student in Psychiatry.
M. D., University of Vermont, 1893.
- ROBERT JOHN FLOODY, S. T. B., 43 Endicott St.
Student in Philosophy.
Graduate, Teachers Training School, Ont., Can., 1882; B. S., Albion College, 1890; M. S., 1894; S. T. B., Boston University, 1894; Student in Philosophy, Clark University, 1904-05.
- McLEOD HARVEY, A. B., 5 Oread Place.
Student in Philosophy.
A. B., Dalhousie College, Halifax, Nova Scotia, 1889; Graduate in Theology, Presbyterian College, Halifax, 1891; Student in Philosophy, Clark University, 1902-05.
- WILLIAM W. HASTINGS, PH. D., Springfield, Mass.,
Student in Biology.
A. B., Maryville College, 1886; A. M., 1894; A. M., Haverford College, 1894; Ph. D., 1896; Graduate, Union Theological Seminary, 1891.
- ALBERT WELLMAN HITCHCOCK, B. D., 8 Institute Rd.
Student in Philosophy.
A. B., Amherst College, 1882; A. M., 1885; B. D., Yale, 1889; Hooker Fellow, Yale, 1889-90; Yale Fellow, Berlin and Oxford Universities, 1890-91; Student in Philosophy, Clark University, 1902-05.
- MAY SALONA HOLMES, M. D.,
Student in Psychology and Biology. Isolation Hospital.
M. D., Woman's Medical College of New York Infirmary, 1895; House Officer, Memorial Hospital, Worcester, 1895-96; Superintendent and Resident Physician, Isolation Hospital, 1896- .
- FRANCES A. JUDSON, Chicago, Ill., 84 Woodland St.
Student in Psychology.
- ALLAN BALCOM MILLER, A. B., 32 Westland St.
Student in Biology.
A. B., Collegiate Department, Clark University, 1905.
- ELLSWORTH W. PHILLIPS, 20 Princeton St.
Student in Psychology.
A. B., Williams College, 1888.
- INMAN L. WILLCOX, A. M., 138 Elm St.
Student in Philosophy.
A. B., Hamilton College, 1886; A. M., Harvard University, 1900; Student, Andover Theological Seminary, 1886-1889; Scholar in Psychology, Clark University, 1901-02; Student, 1902-05.

WILLIAM ANDREW WOOD,
Student in Philosophy.

11 Shelby St.

A. B., Baldwin University, 1887 ; A. M., 1890 ; S. T. B., Boston University,
1890.

ATTENDANTS UPON SATURDAY COURSES.

| | |
|--------------------------|------------------------|
| F. A. ANDREWS, | Worcester, Mass. |
| MRS. S. VIRGINIA ATWELL, | Worcester, Mass. |
| CORA A. BALDWIN, | Worcester, Mass. |
| FRANK HOWE BENEDICT, | Sutton, Mass. |
| EDITH N. BENTLEY, | Worcester, Mass. |
| GEORGE F. COLE, | Worcester, Mass. |
| OLIVER R. COOK, | Worcester, Mass. |
| CHARLES W. DELANO, | Worcester, Mass. |
| LEONARD G. FAIRCHILD, | Worcester, Mass. |
| SARAH L. GOULD, | Worcester, Mass. |
| MRS. JULIA PAYNE HILL, | Worcester, Mass. |
| CHARLES E. KEYES, | West Brookfield, Mass. |
| MARIETTA KNIGHT, | Worcester, Mass. |
| WILLIAM R. KRAMER, | Winchendon, Mass. |
| MAURICE J. LACEY, | Worcester, Mass. |
| LISBETH LARNED, | Worcester, Mass. |
| JULIA C. MACKIN, | Worcester, Mass. |
| GRACE ELDRIDGE MIX, | Worcester, Mass. |
| ANNIE W. NEWELL, | Millbury, Mass. |
| LUCY H. OLMSTED, | Worcester, Mass. |
| LUCY A. OSBORNE, | Worcester, Mass. |
| BESSIE S. PIERCE, | Worcester, Mass. |
| EDWARD P. ST. JOHN, | Hartford, Conn. |
| FRANK ARTHUR SCOTT, | Holliston, Mass. |
| ELISABETH ROSS SHAW, | Waverley, Mass. |
| KATE E. SMITH, | Worcester, Mass. |
| ELIZABETH C. WOODMAN, | Worcester, Mass. |

FLORENCE CHANDLER,
Clerk of the University.

52 Woodland St.

ADMINISTRATION.

The trustees are the ultimate source of authority in all matters pertaining to the University. They act collectively through the committees named below, and also through the president of the University.

BOARD OF TRUSTEES.

| | |
|-------------------|----------------------|
| EDWARD COWLES, | A. GEORGE BULLOCK, |
| THOMAS H. GAGE, | ORLANDO W. NORCROSS, |
| CHARLES H. CLARK, | FRANCIS H. DEWEY, |
| ROCKWOOD HOAR, | ARTHUR F. ESTABROOK. |

OFFICERS.

| | | | |
|-----------------|---|---|--------------------|
| President, | . | . | A. GEORGE BULLOCK, |
| Vice-President, | . | . | FRANCIS H. DEWEY, |
| Treasurer, | . | . | THOMAS H. GAGE, |
| Secretary, | . | . | G. STANLEY HALL. |

COMMITTEES.

Finance.

| | |
|-----------------|--------------------|
| THOMAS H. GAGE, | A. GEORGE BULLOCK, |
| | FRANCIS H. DEWEY. |

Buildings.

| | |
|-----------------|----------------------|
| THOMAS H. GAGE, | ORLANDO W. NORCROSS. |
|-----------------|----------------------|

DUTIES OF THE PRESIDENT OF THE UNIVERSITY.

The duties of this office were defined by the Trustees, May 23, 1889, as follows :

The President of the University shall consult frequently with the Trustees on all matters which concern the welfare of the University, and attend the meetings of the Board. He shall confer with each instructor concerning the development of his department, determine the duties and authority of each, and preside at the meetings of the Faculty. He shall be the authorized medium of communication between the Board of Trustees and the officers of instruction, individually and collectively, in all matters involving the administration of the University. The enactments of the Board concerning instructors and their work, and all requests, complaints and proposals from the Faculty to the Trustees shall be made known through him. He shall exercise or provide such superintendence over buildings, apparatus, books and other property, as will secure their protection and appropriate use. Expenditures must not be ordered by any instructor of the University without his previous consent or the express authority of the Board.

These duties were more fully defined by By-Laws enacted by the Corporation Sept. 26, 1889. These are as follows:

BY-LAWS.

1. The President of the University shall preside on all public academic occasions, shall direct the official correspondence, study the wants and interests of the whole University and exercise a general superintendence

over all its concerns. His first care, and that of the authorities of the University, shall be the departments already established, and next those closely related to them; but no other department shall be established until those already introduced have been brought to the highest state of efficiency then possible. All acts, however, which shall involve the expenditure of money in the administration of the University's affairs, shall be subject to the approval of the Board of Trustees or the Finance Committee for the time being.

2. As the efficiency of a University depends chiefly upon the quality of its Faculty, the Board of Trustees will hold the President to a strict but reasonable accountability for the fidelity and ability of each instructor. The President only shall have the power to select and appoint all officers of instruction, subject to the approval of the Board of Trustees. To make wise and well considered appointments, to maintain harmony within the Faculty and to increase their efficiency in research and instruction shall be his most important duty. If at any time the President shall be negligent in the discharge of these or other duties, or is from any cause disabled from discharging them, they may be exercised by the Board of Trustees.

3. The President of the University shall be the medium of communication between the Trustees and Instructors, individually and collectively, upon all matters within the field of action of either body. He shall attend all meetings of the Board of Trustees, of which he shall be notified, and shall participate in their deliberations, but without the power to vote. All complaints and requests from members of one body to the other shall be made through him.

4. The President shall call and preside over all official meetings of the Instructors, and a record of their proceedings shall be kept. These records are in no case to be made known to others than the Trustees. They shall always be in the custody of the President, but may be inspected by the Trustees, or either of them at any time.

5. The President of the University, in the absence of the Trustees or Finance Committee, shall have the entire direction and control of the persons employed about the University and not engaged in the work of instruction; the duties of all such persons shall be assigned and they shall be appointed or removed by him, subject to the approval of the Finance Committee.

6. No instructor shall order any books or apparatus, or anything connected with the work of instruction (beyond his appropriation), without the approval of the President. No expense for the care of buildings or grounds, nor for alterations or repairs within and upon the same shall be made without the approval of the Board of Trustees or the Finance Committee, such alterations or repairs in no case to exceed the appropriations made for that purpose. If the Trustees, or Finance Committee, or any person shall make contracts in behalf of the University without authority, the officer or person making such contract shall become individually responsible therefor.

7. The officers of instruction shall be appointed for a term of from one to five years. At the end of this period the work of each Instructor will be subjected to a careful scrutiny upon the results of which his reappointment shall depend, always provided, however, that any Instructor will be liable to be discharged at any

time for incapacity, neglect of duty, or for such other cause as shall seem good to the Trustees.

8. Each Instructor shall give stated lectures to however few. He shall actively and zealously strive to maintain the highest possible standard, shall work in a spirit of hearty sympathy and co-operation, and shall encourage research by precept, and if possible, by example.

9. The foregoing By-Laws are intended to embody the provisions contained in a vote passed by the corporation on the twenty-third day of May, A. D. 1889, upon the motion of Judge Devens. (See above.) If at any time hereafter any discrepancy shall be found to exist between the two, said By-Laws shall be so far modified as to conform to the provisions of said vote.

10. No instructor shall engage in any outside professional or technical pursuit without the approval of the Board, the Finance Committee, or the President.

11. These By-Laws, or any one of them, may be changed, amended, or repealed by a vote of three-fourths at least of the Trustees at any meeting of their Board duly called, notified, and held for that purpose.

GENERAL STATEMENTS.

The University now consists of a group of eleven departments, in which all its work and that of Instructors, Fellows and Scholars is grouped.

These departments are as follows :

- I. MATHEMATICS.
- II. PHYSICS.
- III. CHEMISTRY.
- IV. BIOLOGY.
- V. ANTHROPOLOGY.
- VI. PSYCHOLOGY.
- VII. EDUCATION.
- VIII. ECONOMICS AND SOCIOLOGY.
- IX. HISTORY.
- X. MODERN LANGUAGES.
- XI. ENGLISH.

THE FACULTY.

The Faculty elect Fellows and take action upon general requirements for the Doctor's degree and other promotions, act and advise upon whatever may be officially submitted to them by the Board or by the President, and consider all matters not otherwise provided for and in which all departments of the University are alike interested.

ADMISSION.

Only graduate students or those of equivalent attainments are admitted to full membership in the University, except in rare and special cases. At present no entrance examinations are required; but by testimonials, diplomas, personal interviews, or written specimens of work, the authorities must be satisfied that the applicants have scholarship enough to work to advantage, and zeal and ability enough to devote themselves to their chosen field. The methods of the University are too costly, and its energy and funds too precious, to be spent upon those who are not well trained, promising, and in earnest.

It is highly desirable that candidates entering any of the eleven departments, shall have, besides a knowledge of the other subjects commonly taught in colleges, a reading knowledge of French and German.

For the select students who are received, it is the purpose of the University to open all its privileges and to supply every incentive possible in the way of books, facilities, and, above all, direct personal stimulus. The chief as well as the best work of this University is individual, and involves daily suggestion, encouragement and direction. The limited number of students per-

mits more or less personal instruction in each case.

CLASSES OF APPOINTEES.

No clearly marked line exists between students and instructors. Fellows who have attained some degree of mastery in a special line of work sometimes give brief special courses, which may be attended by professors. This is a stimulus to the student, and both tests and exhibits power in teaching.

I. DOCENTS.

The highest annual appointment not involving membership in its Faculty is that of Docent. These positions are primarily honors, and are reserved for the few whose work has already marked a distinct advance beyond the Doctorate and who wish to engage in research. Docents are not assistants, and their relations are directly with the President of the University.

Docents may be provided with individual rooms, and special apparatus may be purchased for their work if desired and approved. While they will be expected to deliver a limited number of lectures on some special chapter of their department, their time will be mainly reserved for study and research in a way best adapted to qual-

ify them still more fully for academic advancement.

These positions are official appointments made by the Faculty upon nomination of the head of the department and on the following conditions :

1. The candidate must have received the degree of Ph. D. at least one year before he can enter upon the duties of Docentship.

2. That year must have been spent in research and the candidate must have given evidence of his skill and capacity as a teacher by giving a course of lectures, by assisting in the regular work of instruction in this or some other institution of university rank, or in some other satisfactory manner.

3. The candidate must prepare and read in public an habilitation address approved as such by the chief instructor in his department.

4. If these conditions are fulfilled he will receive at the close of his address a diploma granting him the *venia docendi* for the following year in this University and formally attesting his fitness as both scholar and teacher for an academic chair.

5. The fee for this diploma shall be \$25, which in case of need the Faculty shall have power to remit.

A memoir or essay representing original work

in the department, but no examination, is required. This highest formal academic honor will be strictly reserved for those of marked scientific attainment and teaching ability and, so far as this diploma can have the significance of a title or degree, it will be regarded by the University as a brevet collegiate professorship.

It is believed that the difficulties under which college trustees sometimes succumb in selecting suitable professors may be diminished by the existence of such a select body of scholars of guaranteed scientific training, ability and approved power to teach, and that otherwise this new grade will aid in raising the standard of academic scholarship in colleges and in encouraging scientific research here. Appointees of this class may be paid a small salary.

II. LECTURES.

Those who have already taken the degree of Doctor of Philosophy or who are under appointment as Fellows may, on recommendation of the head of the department, be designated to give a number of lectures upon topics in which they have attained special competency.

III. DOCTORS OF PHILOSOPHY.

Those who have already advanced to the Doc-

tor's degree may be appointed Honorary Fellows and given the privileges of the University, including those of the Library. In past years many who have already taken this degree, either in this country or abroad, and who are awaiting academic appointment, have found these positions both helpful for their own further research and development and also advantageous for obtaining the collegiate and university appointments that they seek.

IV. CANDIDATES FOR THE DEGREE OF DOCTOR OF PHILOSOPHY.

At least one, but in most cases three, years of graduate work are necessary for this degree. Examinations for it, however, may be taken at any time during the academic year when, in the judgment of the University authorities, the candidate is prepared, provided the requirement of one year's residence has been absolved.

For this degree one requirement is a dissertation upon an approved subject, to which it must be an original contribution of value. To this capital importance is attached. It must be reported on in writing by the chief instructor before the examination, printed at the expense of the candidate, and at least one hundred copies given to the University. In case, however, of a disser-

tation of unusual length, or containing expensive plates, the Faculty shall have power, at the request of the candidate, to reduce this number of presentation copies to fifty.

Such formal or informal tests as the Faculty may determine shall mark the acceptance of each student or Fellow as a candidate for this degree. One object of this preliminary test shall be to insure a good reading knowledge of French and German. Such formal candidature shall precede the examination itself by a period prescribed in the special rules below.

The fee for the Doctor's degree is \$25, payable before the examination. The presentation copies of the dissertation must be in the hands of the Librarian before the diploma is delivered. In exceptional cases, and by special action of the Faculty, the act of promotion may precede the presentation of the printed copies of the dissertation.

An oral, but no written, examination is required upon at least one minor subject in addition to the major before an examination jury composed of at least four members, including the head of the department and the President of the University, who is authorized to invite any person from within or without the University to be present and to ask questions. The jury

shall report the results of the examination to the Faculty, who will recommend satisfactory candidates for the degree.

For the bestowal of this degree, the approbation of the Board of Trustees must in each case be obtained by their signature upon the diploma. They desire that the standard of requirements for it be kept the highest practicable, that it be reserved for those of superior ability and attainment only, and that its value be never suffered to depreciate.

It is to the needs of candidates for this degree that the lectures, seminaries, laboratories, collections of books, apparatus, etc., are especially shaped, and no pains will be spared to afford them every needed stimulus and opportunity. It is for them that the Fellowships and Scholarships are primarily intended, although any of these honors may be awarded to others.

On November 14th, 1900, the following vote was passed by the Board of Trustees:

That the University will admit candidates for the degree of Doctor of Philosophy and will confer that degree without regard to the distinction of sex.

SPECIAL RULES CONCERNING THE DOCTOR'S DEGREE.

I. *Residence.* No candidate shall receive the

degree of Doctor of Philosophy without at least one academic year's previous residence.

II. *Candidature for the Doctor's Degree.*

Every applicant for the Doctor's Degree shall fill out, before October fifteenth, the regular application blank provided at the office. This schedule shall be submitted to the head of the department and the instructor in the major subject. Before affixing their signatures they shall satisfy themselves, in such manner as they may desire, as to the fitness of the applicant.

III. When countersigned, this schedule shall be filed with the President, and the applicant will be examined in French and German by the annual Committee for that purpose.

IV. In case of a favorable report by this committee, the applicant shall be a regular candidate for the degree.

V. Candidates complying with all preliminary conditions, including the examinations in French and German, before November first will be allowed to proceed to the doctor's examination at any time between May fifteenth following and the end of the academic year.

VI. *The Doctor's Dissertation.* The dissertation must be presented to the instructor under whose direction it is written, and reported upon by him before the doctor's examination. In every

case the dissertation shall be laid before the jury of examination, at the time of examination, in form suitable for publication. This provision shall not, however, preclude the making of such minor changes later as the chief instructor may approve.

VII. The dissertation shall be printed at the expense of the candidate and the required copies deposited with the Librarian within one calendar year after the first of October following the examination. The candidate alone will be held responsible for the fulfilment of these conditions.

VIII. The favorable report of the chief instructor, filed in writing with the Clerk of the University, shall be a sufficient imprimatur or authorization for printing as a dissertation. The printed copies shall bear upon the cover and title page the statement of approval in the following words, over the signature of the chief instructor :

A Dissertation submitted to the Faculty of Clark University, Worcester, Mass., in partial fulfilment of the requirements for the degree of Doctor of Philosophy, and accepted on the recommendation of

(NAME OF CHIEF INSTRUCTOR.)

IX. *Examinations for the Doctor's Degree.* The examinations for the doctor's degree may be held at any time during the academic year, provided that at least one academic year has elapsed since the completion of the preliminaries

of candidature, except in the case of fulfilment of these conditions between the beginning of any academic year and November first of that year, to which case Rule V applies. The examinations shall be held at such hours and places as the President may appoint.

X. Examinations may also be held during the regular vacations of the University, but for these an additional fee of five dollars to each examiner and the reasonable travelling expenses of any examiners who are out of town, all payable in advance, will be required.

V. DEGREE OF MASTER OF ARTS.

This degree is conferred upon candidates who comply with the following requirements :

1. The candidate shall have previously taken the degree of Bachelor of Arts, or have had a substantial equivalent for the training implied by that degree, to be determined by special vote of the Faculty ; but such degree or training must involve a good preparation for the work proposed for the Master's degree, in order that it may be accepted.

2. The candidate must devote a full academic year to post-graduate work in this University after receiving the Bachelor's degree or the training accepted as its equivalent. This work shall

be mainly in one department, but the candidate may do also such other work as shall be advised by the head of his principal department,—whose approval of the whole course shall be necessary. In particular cases, the candidate may be allowed, by special vote of the Faculty, to divide his work between two years ; but the aggregate must, in all cases, amount to a full year's work, at least.

3. The candidate must satisfy the representatives of his principal department that he has done his work faithfully, and has mastered the subjects involved, by such written and oral examinations and other tests as the department may require. The head of the department shall make a written report to the Faculty of the grounds on which the candidate is recommended, specifying the amount and character of his work ; and this report shall be filed in the office.

4. The candidate must present a thesis or written report on some topic included in his course or closely related to it, that shall receive the approval of the representatives of his principal department, be accepted by the Faculty, and filed in the office.

5. Every candidate recommended for the Master's degree shall pay a fee of ten dollars.

6. The Master's degree will be conferred at the annual Commencement in June of any year

on those candidates only who shall have made written application to be considered as such on or before January 15th preceding and shall have fulfilled all the conditions here specified at least one week before Commencement, at which time the academic year shall be regarded as ending for the purposes of section 2.

VI. SPECIAL STUDENTS NOT CANDIDATES FOR A DEGREE.

Any one desiring to undertake a special and approved line of research, and whose attainments are such as to satisfy the requirements of the University, may also be received. This class includes persons who may desire to devote themselves exclusively to one or more of the special branches—mathematics, physics, chemistry, biology, anthropology, psychology, education, economics and sociology, history, or modern languages—but who do not care to matriculate or become candidates for a degree.

These students, provided they satisfy the heads of the departments of their training and competency in one subject, in which they must be advanced (although they may be less so, or even beginners, in other subjects), may be allowed entire freedom in their choice and combination of

studies, and as special students may enjoy all the privileges of the University.

These students may, with the approval of the President, be received for less than an entire year.

VII. PRELIMINARY CANDIDATES.

Non-university students of less special or less advanced standing than the above classes, who contemplate becoming candidates for some higher degree, may also be received.

Students of this class must satisfy the authorities of the University of their attainments and that they contemplate advancing to a degree higher than that of A. B. The privileges and status of these students will be more fully defined later. They may, in exceptional cases, be elected to Scholarships.

FELLOWSHIPS AND SCHOLARSHIPS.

From the George F. Hoar Fund of \$100,000, provided by the generosity of Andrew Carnegie, the sum of \$3,000 is now available for Junior and Senior Fellowships in the University. While the sums attached to these appointments are not fixed, a Senior Fellow may receive \$200 together with the remission of fees, which makes the value of the appointment \$300. A Junior Fellow may receive \$100 with remission of fees,

which makes the value of the appointment \$200. Besides these, other appointments of Senior and Junior University Scholarships, with remission of fees, are made.

A CITIZEN'S FUND.

A citizen of Worcester has given a fund of \$5,000, the income of which is to be used for the aid of "some one or more worthy native born citizens of the city of Worcester who may desire to avail themselves of the advantages of the institution."

THE FIELD FUND.

Mrs. Eliza W. Field has also given \$500, to be called the "John White Field Fund," the income of which is "to provide for the minor needs of a Scholar or Fellow."

The following regulations apply to the award of the income of the Field Fund:

1. Regard is had to the intellectual ability of the candidate as well as to need of pecuniary assistance.

2. Only candidates who have spent three months at the University are considered.

3. The head of each department will consider and report to the Faculty desirable cases in his department.

4. Applications are received not later than December 15th, and the awards made as soon as possible after the Christmas recess.

PURPOSE AND CONDITIONS OF FELLOWSHIPS AND SCHOLARSHIPS.

Fellowships at Clark University are intended for young men and women of promise who desire to pursue post-graduate studies in order to fit themselves for intellectual careers. It is desirable, but not required, that candidates for these positions should intend to proceed to the degree of Doctor of Philosophy or to equivalent attainments. In general, those intending to devote themselves to some special branch of learning are preferred to those directly fitting themselves for one of the three learned professions, although the latter are not excluded.

No application blanks are provided, but it is desired that the candidate should state fully and in writing his course of study and submit testimonials or diplomas, especially such as indicate a decided preference for some particular department. These should also, if practicable, be accompanied by some specimen of the candidate's work. Applications will be considered in May and in October and should be in the hands of the President on or before the first day of either

month. In special cases vacancies may be filled by appointments at any time during the year. The names of unsuccessful candidates will not be made public.

Fellows must reside in Worcester during the entire academic year, devote themselves to special studies under the direction of their instructors, and give such evidence of progress or proficiency before the end of the year as the authorities shall require. It is generally expected that they will undertake some work of research during the year. They must co-operate in promoting harmony, order, and all the ends of the University, must not teach elsewhere, and may be reappointed at the end of the year. Being intended primarily as honors, both Fellowships and Scholarships are awarded without reference to pecuniary needs, so that those able and desiring to do so may relinquish the emolument and retain the title of "Scholar" or "Fellow."

The paying fellowships will, for the present, be restricted to the departments of mathematics, physics, biology, psychology and education.

METHODS.

Besides field work, excursions to institutions (public and private), coaching and cram classes, clubs, examinations and other modes by which

knowledge now seems best imparted and retained, the following educational methods are prominent:

LECTURES. The Trustees desire that each instructor, of however few students, should prepare and deliver regular lecture courses, with diagrams, illustrative apparatus, and reference to standard text-books and the best current literature upon each topic. Advanced students are also encouraged to supplement the work of the professors by giving occasional special lectures and courses. Public lectures will be given from time to time.

SEMINARIES AND CONFERENCES. These are stated meetings for joint systematic work, under the personal direction of the professor, in some special part of his subject. Here students preparing theses and other papers for publication in the journals edited at the University read them in incomplete form for mutual criticism and help. Here, also, the results of individual reading are reported for the benefit of all; views are freely criticised; new inquiries, methods, comparisons, standpoints, etc., suggested. From the mutual stimulus thus given, many important works have proceeded and the efficiency of universities has been greatly increased.

LABORATORY WORK. For beginners this has

been from the first the best of all forms of apprenticeship, bringing student and professor to a closer and mutually stimulating relation. Here the manipulation of apparatus is learned, processes are criticised, results obtained by other investigators are tested, and methods discussed and perfected, with a view to developing that independence in research which is the consummation of scientific culture.

NOTICES.

The charge for tuition, giving all the privileges of the University, but not covering the laboratory fees, is \$100 per annum.

Board and lodging can be obtained near the University at very moderate rates.

Intending students will be given information, so far as possible, upon any of these or other points, in advance of official announcement, upon addressing the Clerk of the University, Miss Florence Chandler, Worcester, Mass.

All members of the University are expected to be present at the opening of each term and to continue in attendance to its close.

The following are the statements and announcements of the departments for the academic year, 1906-1907.

I

MATHEMATICS.

PROGRAMME FOR 1906-1907.

INSTRUCTION IN MATHEMATICS.

The chief aim of the department is to make independent investigators of such students as have mathematical taste and ability; these naturally look forward to careers as teachers of the higher mathematics in colleges and universities, and we believe that the course of training best adapted to the development of investigators is also that which is most suitable for all who would be efficient college professors, even if they are not ambitious to engage in research. The first essential of success in either of these lines is the habit of mathematical thought, and the direct object of our instruction is the acquisition of this habit by each of our students. With this end in view, we expect every student to make himself familiar with the general methods and most salient results of a large number of different branches of mathematics, conversant with the detailed results and the literature of a few branches, and thorough master of at least one special topic to the extent of making a real contribution to our knowledge of that subject.

In accordance with these principles, the instruction is given by means of introductory, advanced, and special courses of lectures, seminars, and personal guidance in reading and investigation.

The introductory courses (mostly given in alternate years) treat the following subjects:

ANALYTIC GEOMETRY OF HIGHER PLANE CURVES, HIGHER SURFACES, AND TWISTED CURVES; 5 hours a week, through the year.

DIFFERENTIAL EQUATIONS, AND CALCULUS OF VARIATIONS; 5 hours a week, through the year.

THEORY OF FUNCTIONS OF REAL AND IMAGINARY VARIABLES, ELLIPTIC FUNCTIONS, AND DEFINITE INTEGRALS; 5 hours a week, through the year.

THEORY OF NUMBERS; 2 hours a week, one-half year.

MODERN SYNTHETIC GEOMETRY; 2 hours a week, one-half year.

ALGEBRAIC SUBSTITUTIONS AND THEIR APPLICATION TO THE THEORY OF EQUATIONS; 2 hours a week, one-half year.

ALGEBRAIC INVARIANTS; 2 hours a week, one-half year.

FINITE DIFFERENCES; 2 hours a week, one-half year.

It is expected that every student will take each course in the earliest year of his residence in which it is given, unless he has already completed an equivalent course elsewhere. The chief object of these courses is to make the student familiar with the various methods of mathematical research and the concepts of mathematical thought at the present day. Thus, for example, curves and surfaces are treated by modern methods from the beginning, with adequate consideration of the discoveries of the great geometers of recent times. The usual college courses in the theory of algebraic equations, analytic geometry, and the differential and integral calculus furnish all the necessary preparation for these introductory courses, although it is very desirable that the student be acquainted with the properties of determinants and their application to the solution of linear equations, and with the methods of solving differential equations of the simpler types. Deficiencies in these subjects may

be made up by attendance on the corresponding courses in the Collegiate Department of the University.

A Seminary will be conducted in connection with the introductory courses, in which the students will be exercised in individual investigation and the oral presentation of results. The literature of the topics discussed will here receive adequate attention.

Special advanced courses, open to such as have nearly or quite completed the introductory courses, are given annually in subjects varying with the interests of the instructors and the needs of the students.

Each advanced student is placed under the supervision of one of the instructors for guidance in the original investigation of some special topic; the successful issue of this investigation may furnish material for the dissertation required of a candidate for the degree of Doctor of Philosophy.

For the academic year 1906-1907, the following courses are offered.

By PROFESSOR STORY.

SEMINARY FOR ADVANCED STUDENTS; through the year.

Introductory courses:

ANALYTIC GEOMETRY OF HIGHER PLANE CURVES, HIGHER SURFACES, AND TWISTED CURVES; 5 hours a week, through the year.

FINITE DIFFERENCES; 2 hours a week, first half-year.

ALGEBRAIC INVARIANTS; 2 hours a week second half-year.

Advanced courses:

DIFFERENTIAL GEOMETRY; 2 hours a week, first half-year.

THEORY OF ERRORS; 2 hours a week, second half-year.

BY PROFESSOR TABER.

Introductory Course :

THEORY OF FUNCTIONS OF REAL AND IMAGINARY VARIABLES,
ELLIPTIC FUNCTIONS, AND DEFINITE INTEGRALS : 5 hours a
week, through the year.

Advanced Course :

THEORY OF GROUPS ; 2 hours a week, through the year.

SEMINARY, through the year.

BY PROFESSOR WEBSTER.

[See announcement of Department of Physics, courses 7, 8, 9, 10.]

BY M. DE PEROTT.

Introductory Course :

THEORY OF NUMBERS ; 2 hours a week, first half-year.

Advanced Course :

ABELIAN INTEGRALS ; 2 hours a week, second half-year.

During the academic years 1889-1906, advanced and special courses have been given in :

1. THE HISTORY OF MATHEMATICS among various peoples from the earliest times to A. D. 1650.
2. THEORY OF NUMBERS.
3. LINEAR TRANSFORMATIONS AND ALGEBRAIC INVARIANTS, with applications to algebraic equations and geometry.
4. THEORY OF SUBSTITUTIONS, with applications to algebraic equations.
5. PLANE ANALYTIC GEOMETRY.
6. SOLID ANALYTIC GEOMETRY.
7. HYPERSPACE AND NON-EUCLIDEAN GEOMETRY.
8. ENUMERATIVE GEOMETRY.
9. QUATERNIONS, with applications to geometry and mechanics.
10. MULTIPLE ALGEBRA, including matrices, quaternions, the "Ausdehnungslehre," and extensive algebra in general.
11. MODERN SYNTHETIC GEOMETRY.

12. THEORY OF FUNCTIONS according to Cauchy, Riemann, and Weierstrass, with applications.
13. WEIERSTRASS'S THEORY OF ELLIPTIC FUNCTIONS.
14. ABELIAN FUNCTIONS AND INTEGRALS.
15. NUMERICAL COMPUTATIONS.
16. THEORY OF QUADRATIC FORMS.
17. ANALYSIS SITUS, particularly the connectedness of surfaces and map-coloring.
18. SURFACES OF THE THIRD AND FOURTH ORDERS (analytically treated).
19. PLANE CURVES OF THE THIRD AND FOURTH ORDERS (analytically treated).
20. KLEIN'S ICOSAHEDRON-THEORY.
21. ELLIPTIC MODULAR FUNCTIONS.
22. THETA-FUNCTIONS OF THREE AND FOUR VARIABLES.
23. RIEMANN'S THEORY OF HYPERELLIPTIC INTEGRALS.
24. SYMBOLIC LOGIC.
25. TWISTED CURVES AND DEVELOPABLE SURFACES (torses).
26. RATIONAL AND UNIFORM TRANSFORMATIONS OF CURVES AND SURFACES.
27. THEORY OF FUNCTIONS OF A REAL VARIABLE.
28. DEFINITE INTEGRALS AND FOURIER'S SERIES.
29. ORDINARY DIFFERENTIAL EQUATIONS, including differential equations with infinitesimal transformations, general theory of linear differential equations, Gauss's, Legendre's, and Bessel's functions.
30. PARTIAL DIFFERENTIAL EQUATIONS, including Laplace's, Bessel's, and Lamé's functions.
31. FINITE DIFFERENCES AND PROBABILITIES.
32. APPLICATIONS OF THE INFINITESIMAL CALCULUS TO THE THEORY OF SURFACES.
33. SIMULTANEOUS EQUATIONS, including Restricted Systems.
34. THEORY OF TRANSFORMATION GROUPS.
35. THE APPLICATION OF TRANSFORMATION GROUPS TO DIFFERENTIAL EQUATIONS.
36. THEORY OF ERRORS.

The advanced and special courses are not repeated at regular intervals, but properly prepared students will

receive the personal assistance of one or other of the instructors in reading any subject not announced for the year in which they desire to take it.

The number and scope of the advanced courses given each year have been, thus far, regulated by the number of students qualified to profit by them and by the individual interests of the instructors ; these courses will be increased, both in number and variety, whenever a real demand for such an increase shall make itself apparent. While the present purely scientific character of the University precludes instruction in strictly technical branches, we hope that the time is not far distant when the demand shall make it advisable, and increased facilities shall make it possible, to announce courses in Descriptive Geometry, Graphical Statics, Mathematical Astronomy, Vital Probabilities, and all the more important applications of mathematics to other sciences and to technical subjects. The applications of mathematics to physics already receive adequate consideration, and the further extension of such applications awaits only a demand for it on the part of students.

Each year seminars for the training of students in methods of investigation are conducted by the several instructors, and those who have attained the necessary proficiency are personally directed in individual researches, of which the results are published in various mathematical journals.

The degree of Doctor of Philosophy is conferred upon such students as have completed all the introductory courses and a satisfactory number of advanced and special courses, have presented approved memoirs embodying the results of original investigation, and have passed creditable examinations in their principal depart-

ment of study and in one subordinate department. Mathematical students are generally advised to offer theoretical physics as their subordinate subject, and facilities are given for acquiring the requisite knowledge of this subject during their first or second year at the University.¹ Three years of University work are ordinarily necessary to obtain the degree.

Every facility for the study of special branches will be given to properly prepared students who are not candidates for the doctor's degree, and to those who, having already taken the degree (here or elsewhere), wish to continue mathematical study or investigation.

MATERIAL FACILITIES.

The library is provided with the more important textbooks, treatises, and memoirs on the various branches of mathematics, as well as the principal journals and transactions of learned societies that are devoted to any considerable extent to mathematics. Among the periodicals of which the library has complete or nearly complete sets are the following :

Abhandlungen der math.-phys. Classe der Königl. Sächsischen Gesellschaft der Wissenschaften. Leipzig, 1852 to date. Complete.

Acta Mathematica. Stockholm, Berlin and Paris, 1882 to date. Complete.

American Journal of Mathematics. Published under the auspices of the Johns Hopkins University, Baltimore, 1878 to date. Complete.

Annales scientifiques de l' Ecole Normale supérieure. Paris, 1864 to date. Complete.

Annali di Matematica Pura ed Applicata. Milano, 1889 to date.

¹ For requirements see p. 52.

Annals of Mathematics. Published under the auspices of Harvard University, 1899 to date.

Berichte über die Verhandlungen d. Königl. Sächsischen Gesellschafts. d. Wiss. zu Leipzig, 1889 to date.

Bibliotheca Mathematica. Stockholm, Berlin and Paris, 1887 to date.

Bulletin de la Société Mathématique de France. Paris, 1873 to date. Complete.

Bulletin of the American Mathematical Society. Continuation of the *Bulletin of the New York Mathematical Society.* New York, 1894 to date. Complete.

Bulletin of the New York Mathematical Society, New York, 1891-94. Complete.

Bulletin des Sciences Mathématiques (Darboux, etc.). Paris, 1870 to date. Complete.

Comptes Rendus hebdomadaires des Séances de l'Académie des Sciences. Paris, 1835 to date. Complete.

Educational Times, and Journal of the College of Preceptors. London, 1890 to date.

Jahrbuch über die Fortschritte der Mathematik. Berlin, 1868 to date. Complete.

Journal de l'École Polytechnique. Paris, 1794 to date. Complete.

Journal de Mathématiques pures et appliquées. (Liouville.) Paris, 1836 to date. Complete.

Journal für die reine und angewandte Mathematik (Crelle, etc.). Berlin, 1826 to date. Complete.

The Mathematical Review, Worcester, Mass.

Mathematische Annalen (Clebsch, etc.). Leipzig, 1869 to date. Complete.

Mathematische und Naturwissenschaftliche Mittheilungen aus den Sitzungsber. d. Königl. Preussischen Akad. der Wissen. zu Berlin. 1892 to date.

Messenger of Mathematics. Oxford, Cambridge and Dublin, 1862 to date. Complete.

Nachrichten von der Georg-Augusts-Universität und der Königl. Gesellschaft der Wissenschaften zu Göttingen. 1853-88.

Nouvelles Annales de Mathématiques. Paris, 1842 to date. Complete.

Philosophical Magazine and Journal of Science. London, Edinburgh and Dublin, 1798 to date. Complete.

Philosophical Transactions of the Royal Society. London. 1665 to date. Complete.

Proceeding of the Cambridge Philosophical Society. 1843 to date. Complete.

Proceedings of the London Mathematical Society. London, 1865 to date. Complete.

Proceedings of the Royal Society of London. 1800 to date. Complete.

Quarterly Journal, Pure and Applied, of Mathematics. London, 1857 to date. Complete.

Revue semestrielle des Publications Mathématiques. Amsterdam, 1893 to date. Complete.

Transactions of the American Mathematical Society. Lancaster, Pa., and New York, 1900 to date. Complete.

Transactions of the Cambridge Philosophical Society. 1822 to date. Complete.

Zeitschrift für Mathematik und Physik (Schlömilch, etc.). Leipzig. Complete from Vol. 34 (1888) to date.

The University possesses a set of Brill's admirable models (wanting only those published during the last few years, which will be obtained as soon as possible) and Björlings thread models of developable surfaces.

The department possesses also :

An Amsler Planimeter (with revolving table), and a Thomas Arithmometer.

II.

PHYSICS.

Professor Webster will deliver regularly, with a period of two years, the following cycle of unstarred courses. The starred courses have been given, or will be given at irregular intervals. The lectures occupy from five to seven hours weekly.

1. DYNAMICS. GENERAL PRINCIPLES, CANONICAL EQUATIONS, METHODS OF HAMILTON AND JACOBI, SYSTEMS OF PARTICLES, RIGID BODIES.

2. NEWTONIAN AND LOGARITHMIC POTENTIAL FUNCTIONS, ATTRACTION OF ELLIPSOIDS.

2a.* FIGURE AND MOTION OF THE EARTH.

3. ELASTICITY, HYDRODYNAMICS, WAVE AND VORTEX MOTION, DYNAMICAL BASIS OF SOUND AND LIGHT.

3a.* DYNAMICS OF CYCLIC AND OSCILLATORY SYSTEMS, with APPLICATIONS TO THEORY OF ELECTRICITY, SOUND AND LIGHT.

3b* THE THEORY OF RESONANCE WITH APPLICATIONS TO THE MEASUREMENT OF SOUND AND TO WIRELESS TELEGRAPHY.

4. ELECTRICITY AND MAGNETISM.

4a.* RECENT DEVELOPMENTS IN ELECTRICAL THEORY, INCLUDING THE THEORY OF LORENTZ.

5. OPTICS, PHYSICAL AND GEOMETRICAL. ELASTIC AND ELECTROMAGNETIC WAVE-THEORIES.

5a*. COMPARISON OF THE THEORIES OF THE ETHER.

6. THERMODYNAMICS, THERMO- AND ELECTRO-CHEMISTRY, KINETIC THEORY OF GASES, RADIATION.

7. THE PARTIAL DIFFERENTIAL EQUATIONS OF MATHEMATICAL PHYSICS.

Laplace's Equation, Equation of Thermal and Electrical conduction, Equation of Wave-motion, Beltrami-Lorentz Equation, Telegrapher's Equation, Methods of Cauchy, Green, and Rie-

mann, Developments in Series, Legendre's, Laplace's, Bessel's and Lamé's Functions.

8.* LINEAR DIFFERENTIAL EQUATIONS.

9.* ELLIPTIC FUNCTIONS, with certain physical applications.

10. ORTHOGONAL SURFACES AND CURVILINEAR CO-ORDINATES, and their applications.

The courses for the year 1906-07, will be 1, 2, 3, 4, (3 b, 4 a, 5, 5 a, 6, 7 have been given this year).

(The substance of courses 2, 3 a, and 4 is to be found in Dr. Webster's Treatise on the Theory of Electricity and Magnetism, Macmillan and Co., London and New York. That of courses 1, 2, 2 a, 3, 3 a is contained in his Treatise on Dynamics, B. G. Teubner, Leipzig.)

In addition to the above courses, there is held a weekly Colloquium, or meeting for the informal discussion of subjects not treated in the lectures, and for the presentation of summaries of important articles appearing in the journals.

A part of the work of the colloquium consists in the systematic presentation of certain classical researches, connected more or less with the lectures, in preparing which the students make use of the original sources of information, thus gaining much experience in methods of research. The work of the colloquium has an excellent effect in training students to present their ideas in a systematic manner before an auditory.

In addition to the lectures announced above, advanced courses may occasionally be given on subjects not included in the list of starred courses.

The aim of the department is to insure in its students some acquaintance with all the various fields of experimental physics, to develop in them the power of exact measurement, to accustom them to exact reasoning from experiment to theory, and to encourage original research conducted on a sound basis. To this end students will

be put at work in the laboratory upon experiments of sufficient difficulty to give them skill in measurements of precision, and to enable them to become familiar with the precautions and corrections necessary to be employed in exact work. After a sufficient amount of experience has been gained, and the student has shown himself to be possessed of sufficient originality to warrant independent investigation, he will be encouraged to take up for himself an original research in the hope of making a personal contribution to science. In this research he will have at all times the benefit of the direction and advice of the professor.

In the belief that no sound knowledge of physics is at the present day possible without a clear appreciation of the means of expressing facts in accurate form, from which exact deductions may be drawn, much stress is laid on the acquisition of familiarity with the application of mathematical analysis to physics, and the courses of lectures are shaped with that end in view. These aim to give the student some acquaintance with the whole field of theoretical physics, to familiarize him with those general methods that appear in the various branches and to show him how he may avail himself of them in practice. It is the constant endeavor in the lectures to bring out the physical essence that is concealed in the formulæ, in order that the student may recognize not merely the formula, in whatever department of physics it may occur, but the physical truth involved. As an instance may be mentioned the treatment of the partial differential equation of Laplace, whose meaning, whether in connection with distributions of Newtonian force, with the steady flow of heat or electricity, certain cases in hydrodynamics and sound, or in the theory

of magnetic and electric induction, is physically the same, and indicates what was termed by Faraday the tubular, or solenoidal, distribution of a vector. Further examples are furnished by the geometrical properties of linear vector functions, of so frequent occurrence, and by the properties of such vector functions that one represents the "curl," or "rotation," of another.

Before all things, however, are made prominent the idea of Energy and its laws, so that in each department the subject is developed as far as possible from the mathematical expression of the energy involved. Physics may be defined as the Science of Energy, and it is attempted, as far as possible, to make each portion of mathematical physics depend upon simple dynamical principles.

The value of a sound knowledge of dynamics to the student of physics cannot be overestimated, and the course in dynamics forms the natural foundation for the remaining courses.

It should be urged upon intending students to prepare themselves, not only in ordinary laboratory measurements, but also in mathematics, the lack of proper mathematical preparation being a serious drawback to the appreciation of the lectures. In particular may be recommended for study not merely those portions of the calculus which deal with the working out of many indefinite integrals, etc., but the theoretical portions which deal with the ideas of partial derivatives, definite integrals, and their practical manipulation, together with enough analytic geometry to involve the properties of lines and *surfaces* of the second order, and a fair amount of the elements of determinants. As suitable text-books for preparation may be recommended to the stu-

dent Lamb's, Gibson's, Williamson's, or Byerly's Differential and Integral Calculus, C. Smith's Analytical Geometries, and Muir's or Hanus's Determinants. Appell, *Éléments de l'analyse mathématique*, may be very strongly recommended to the intending student for study before and during his course at the University.

It cannot be too strongly urged that the student should, from the beginning, be able to read French and German with ease and to make use of works in them.

REQUIREMENTS FOR THE DOCTOR'S DEGREE.

1. The ability to read at sight specimens of scientific French and German, tested before the first of November preceding the doctor's examination by a committee of two members of the Faculty.

2. The successful passing of an examination upon the general subject of Experimental Physics¹ and upon the subjects named above in the regular course in Theoretical Physics, as a major requirement, together with an examination in one minor subject, to be determined in each particular case by the head of the Physical Department. This subject will be Mathematics or Chemistry.

3. The presentation of a satisfactory dissertation, involving a substantial amount of original work, and forming a contribution of value to pure science. The presentation of the dissertation is a prerequisite to examination.

The time of residence necessary for the proper fulfilment of the above requirements will generally be at least three years, of which at least one will be very largely devoted to work on the dissertation. Students will not be encouraged to enter upon the work of a dissertation until they have acquired sufficient experience to enable them to specialize with advantage.

The aim of the department is to produce physicists rather than electricians, acousticians, opticians, engineers, or narrow specialists of any sort, for although in the nature of things one

¹ Every student is recommended to provide himself with Winkelmann's *Handbuch der Physik* as a work for continual reference.

will be obliged to know more of one subject than of others, yet it seems evident that no thorough knowledge of any branch can be gained without a comprehensive view over the whole subject. Without this the specialist, or the experimentalist lacking a knowledge of mathematics, will continually be falling into pitfalls which the more wary avoid. Furthermore, it can be but a detriment to science to encourage research in new fields by immature and ill-prepared minds and hands.

The following statement is here inserted for the benefit of students of mathematics.

The minor in Mathematical Physics consists of the subject-matter of courses 1, 2, 3 and 7, which are intended to constitute the equivalent of five hours a week for one year. Course 7 is given in alternate years to the other courses. The subject-matter of the course is contained in Dr. Webster's treatise on *Dynamics*, and Riemann-Weber's *Partielle Differentialgleichungen*.

FACILITIES.

At the beginning of the year 1903-04 the Physical Department was moved from the rooms it formerly occupied in the main building to the unoccupied wing of what was formerly known as the chemical building, which was remodelled to accommodate the department. This affords convenient and commodious quarters separate from all other departments, and quite free from disturbance, the chemical laboratories being in the other wing separated by a tight partition. On the ground floor is a room extending across the end of the building, with windows on three sides, forty-five feet long by twenty-two feet wide, above which are three other similar rooms. A lift running from the bottom to the top floor affords a means of transporting apparatus, while its shaft furnishes space for manometer or barometer tubes. In the lower room are four piers with heavy stone tops, and two others below the floor on which can be placed heavy tables. The other rooms on the ground floor are a large dark room, partially below ground, in which the temperature is tolerably constant, containing a very large and heavy pier. The

engine and storage-battery room containing a high-speed steam-engine connected with the heating boiler and a kerosene engine on the same foundation, with the dynamo between, and seventy-five cells of storage-battery, furnishes the power supply. The storage-cells are conveniently arranged so that each one is accessible from each side, above and below, and the ventilation is excellent, while the room is as light and clean as the work-rooms. Distributing switch-boards enable the current from the dynamo or any section of the battery to be supplied to any of the rooms. On the same floor are three rooms constituting the work-shop, one of the most important parts of a research department of physics. The first room is devoted to wood-working and pattern-making, and accommodates also a bench for soldering. The next room contains the machinist's bench, two engine lathes, jeweller's lathe, and planer, and the third room a Rivett precision bench lathe. There is no countershafting in the building, each tool being driven by a separate electric motor, while the capacity of the battery is such that for ordinary purposes it is not necessary to drive the engine for the shop alone, so that perfect quiet and steadiness are ensured. In the shop are executed all repairs and alterations of apparatus, and in addition is constructed the new apparatus requiring continual experiment. Most of the principal pieces of apparatus belonging to this department have been here constructed. In this manner, by having a mechanic always present, an extremely great economy in time and money is effected, and vexatious delays, which would otherwise completely arrest the progress of the work, are avoided. Facilities are also given for the students to construct apparatus for themselves.

On the main floor are the lecture room, the director's office, the large room used as the director's private laboratory and apparatus room, and three other convenient rooms for research. Two of these are arranged so that they may be darkened for photography, and are also fitted with chemical hoods. The large room on the top floor is intended to be used for optical purposes. Every room in the laboratory contains sinks, gas and electric light connections, and several circuits connecting with the switch board in the battery-room.

The laboratory is well equipped with apparatus for research,

besides having the facilities above described for the construction of instruments of any sort needed for that purpose. In addition may be mentioned a large collection of diagrams illustrative of mathematical physics, many of them being originals of the figures in Dr. Webster's "Electricity and Magnetism," and "Dynamics," and a number of interesting models used in teaching dynamics, thermo-dynamics, and electricity, the number of which is continually increasing, and some of which are rarely found. Among these are Maxwell's Dynamical Top and a number of other interesting tops, Rayleigh's induction model, Gibbs's and other thermo-dynamical surfaces.

THE LIBRARY.

Among the most important of the facilities of any department is of course to be named the library, and among the first questions naturally asked may be expected those relating to the accessibility of books to students and the conditions regarding their use.

The library of the Physical Department is large and carefully selected and, in mathematical physics particularly, may fairly be said to contain the best works. Among others may be mentioned :

Collected Writings of Helmholtz, Hertz, Clausius, Kirchhoff, Kelvin, Lorentz, Green, Hopkinson, McCullagh, Joule, Stokes, Maxwell, Rankine, Rayleigh, Regnault, Reynolds, Rowland, Tait, Young, Gauss, Fourier, Laplace, Cauchy, Foucault, Fresnel.

Potential, Electricity and Magnetism. Riemann, Betti, Dirichlet, Mathieu, Somoff, Kirchhoff, Neumann, Minchin, Routh, Clausius, Duhem, Maxwell, Boltzmann, Drude, Mascart and Joubert, Watson and Burbury, Gray, Heaviside, Thomson, Poincaré.

Elasticity. Mathieu, Ibbetson, Love, Todhunter and Pearson, Williamson, Clebsch, Neumann, Lamé, Boussinesq, Résal, Poincaré.

Hydrodynamics. Bassett, Lamb, Kirchhoff, Neumann, Poincaré, Wien.

Light. Mascart, Kirchhoff, Helmholtz, Neumann, Wood, Volkmann, Drude, Résal, Poincaré, Bassett, Curry, Preston, Schuster, Walker.

Heat. Clausius, Helmholtz, Kirchhoff, Planck, Rühlmann, Boltzmann, Voigt, Zeuner, Bertrand, Duhem, Poincaré, Preston.

Sound. Rayleigh, Donkin.

A large number of treatises on Mechanics, and a set of the *Travaux et Mémoires du Comité International de Poids et Mesures*, and of the published memoirs of the *Physikalisch-technische Reichsanstalt*, may also be mentioned.

Among the journals are complete sets of the

Annalen der Physik und Chemie.

Annales de Chimie et de Physique.

Comptes Rendus.

Eclairage Electrique.

Journal of Physical Chemistry.

Nature.

Philosophical Magazine.

Philosophical Transactions.

Physical Review.

Physikalische Zeitschrift.

Proceedings of The Royal Society.

Science.

Science Abstracts.

Zeitschrift für Instrumentenkunde.

The library subscribes to the following journals:

American Journal of Science.

Annalen der Physik.

Beiblätter zu den Annalen der Physik.

Annales de Chimie et de Physique.

Comptes Rendus.

Eclairage Electrique.

Electrical World.

Electrician.

Elektrotechnische Zeitschrift.

Fortschritte der Physik.

Journal of Physical Chemistry.

Journal de Physique.

Nature.

Il Nuovo Cimento.

Philosophical Magazine.

Philosophical Transactions.

Physical Review.

Physikalische Zeitschrift.

Proceedings of The Royal Society.

Science.

Science Abstracts.

Verhandlungen der Deutschen Physikalischen Gesellschaft.

Zeitschrift für Instrumentenkunde.

III.

CHEMISTRY.

The courses in chemistry leading to the degree of Master of Arts are intended to provide work of an advanced nature which shall supplement the elementary work of the undergraduate in such a way as to give the student a broader and more comprehensive view of the subject. At the same time it is intended to encourage in the student a desire for independent investigation, and to offer opportunity for doing specialized work. The work in its general nature falls into the two following groups :

I. Courses of lectures and laboratory work designed to increase the student's general knowledge of chemistry, including such subjects as the chemistry of the rare elements, usually not treated in elementary courses; methods of making pure preparations; analytical methods, qualitative and quantitative; electro-chemistry; optical and photo-chemistry and other special branches of physical chemistry; organic preparations and special methods of organic analysis.

II. Research courses in which the knowledge already acquired is applied to the acquisition of further knowledge through the agency of original investigation.

The laboratory work is much more individual in character than is possible in elementary work. The student is encouraged to undertake that line of work in which he is especially interested, and opportunity is offered to take up any special subject desired, under the direc-

tion of the instructor. The laboratory work will thus be varied to suit the needs of the individual and will partake more of the nature of independent investigation than is possible with the prescribed work of elementary courses. This work will be supplemented by lectures dealing with the theoretical aspects of the subject, and accompanied by general reading and seminary work.

The exact nature and amount of work required for the degree of Master of Arts will be determined individually. In general, it will be work of advanced grade to occupy most of the student's time for one year. This work may be all in this department, or it may be partially in one or more other departments, with the approval of the instructors in those departments.

The lecture course will be varied from year to year to meet the requirements of students. For 1906-1907 the following courses will be offered by DR. MERIGOLD:

ADVANCED INORGANIC CHEMISTRY. Lectures and laboratory work dealing with special analytical methods; sources of error; the chemistry of the rare elements; preparation of pure inorganic compounds. Special consideration will be given in the lectures to the theoretical side of these subjects. The laboratory work may be varied to include any subject along these lines, in which the student may be interested.

ELECTRO-CHEMISTRY. Lectures and laboratory work, dealing with the modern theories of electro-chemical action, including electrolytic action in aqueous and non-aqueous solutions and fused salts; the electrolytic dissociation theory and its application; the laws governing the chemical production of current and electromotive force. Attention will also be given to the more important applications to analytical and synthetical methods, and to technical processes involving electro-chemical action.

An elementary knowledge of the general principles of physical chemistry, electricity and electrical measurements, is a prerequisite for this course.

PHYSICAL CHEMISTRY. Lectures and laboratory work. A general elementary knowledge of the subject is presupposed.

SEMINARY. Reports and discussion of contemporaneous work appearing in current journals, and presentation of special topics.

RESEARCH. Students who have sufficient preparation may take up some line of chemical investigation.

Candidates for the degree who are specializing in chemistry, may, if desired, devote all their time to any one of the subjects outlined above, with the exception of the seminary work, which is required of all who make chemistry a major subject.

Students for whom chemistry is a minor subject may take up any course for which their previous training has prepared them.

In the laboratory work students are expected to become familiar with the literature bearing upon their subject. Consequently a reading knowledge of French and German is essential.

In special cases, when satisfactory reasons exist, either the lectures or the laboratory work of the lecture courses may be taken separately.

IV.

BIOLOGY.

PROGRAMME FOR YEAR 1906-1907.

Dr. Hodge will offer the following courses :

I. DYNAMIC BIOLOGY AND GENERAL PHYSIOLOGY. It is proposed to combine in this course the fundamental laws and principles of biological science, the emphasis being placed on the functional or dynamic side rather than on the side of morphological structure. In other words, the point of view of the course is that living species have assumed certain forms and have developed definite structures in order to fit them to perform a certain work in the economy of nature. Among others, the following topics will serve to outline the scope of the course. Origin and constitution of living matter. Physiological functions. Classification of plants and animals. Biological reactions, tropisms, experimental morphology. Differentiation of organs. Growth and reproduction. Heredity. Variation. Specialization. Evolution. One lecture weekly, October to June. Laboratory work will be arranged to meet the needs of individual students.

II. BIOLOGICAL EDUCATION. The University stratum—history, aims and methods of biological research. The College level—outlines of college courses and history of their development. Biology in the high school. Biological nature study for the elementary schools. Eight lectures, to be arranged for by consultation during the year.

III. A biological seminary will be held one evening weekly throughout the year. In general the work of this seminary is planned to run on a three-year cycle as follows : first year, history of science and of biological research ; second year, philosophy and historical development of evolution ; third year, the laws of heredity and variation. The year 1906-1907 will finish the cycle.

NEUROLOGY.

It is intended to arrange the course in such a manner that the general field may be covered in two years. This will leave the student free to devote his entire time during the third year to special study in the literature of the science and to the prosecution and completion of his thesis work. Accordingly, a two-year cycle will be arranged as follows :

IV. COMPARATIVE STUDY OF NERVOUS SYSTEMS AND SENSE ORGANS. This course will form the natural basis for comparative psychology and together with the working out of a minor problem may well constitute a minor for one whose major is psychology or philosophy. On the biological side it will be closely correlated with general physiology and morphology. It is intended to begin with a comparative study of the structural elements of the nervous system of both invertebrates and vertebrates and then correlate and compare the differing degrees of complexity of function with the anatomical organization found in the ascending series. The course will be illustrated throughout by diagrams, models, dissections and microscopical preparations and experiments. Laboratory work one afternoon weekly, or will be arranged to meet the needs of individual students. One hour weekly for general class exercise, or its equivalent.

V. THE HUMAN NERVOUS SYSTEM AND SENSE ORGANS. This course will deal with the anatomy, both gross and microscopic, and with the physiology and hygiene—fatigue and sleep, growth and development, localization—of the brain. One hour weekly, or the equivalent. Laboratory one afternoon a week, or arranged to meet the needs of individual students.¹

By way of supplementing the above and courses in other departments of the University, two special courses have been planned as follows :

VI. PRACTICAL HISTOLOGY. The course will be a laboratory course, with such lectures, directions and conferences as

¹For elementary courses in special physiology, histology and hygiene, refer to announcement of biological courses in the Collegiate Department.

may be required by those taking it. It will be arranged practically to meet the needs of individual students. Considerable latitude will be given, so that any who wish may make it a comparative study by way of supplementing course I, prepare a series of demonstrational specimens for themselves, or devote their time to special problems.

VII. For those who do not take work in the laboratory, but desire to see the actual specimens and experiments, a course of demonstrations to run somewhat parallel with the above courses will be offered. One hour weekly, through the year.

EXPERIMENTAL WORK.

Laboratory work in biology, physiology, histology, and neurology is arranged to meet the needs of individual students. Its general purpose is to facilitate practical familiarity with methods of research, and as soon as practicable each student is expected to begin an original investigation. Standard apparatus of most improved types is at the disposal of the laboratory, and when new work requires specially devised apparatus, every effort within the means of the department is made to obtain it. A workshop supplied with lathe and good equipment of tools for working both wood and metal is attached to the laboratory, and with these facilities minor pieces of apparatus may be well made or old apparatus altered to suit the demands of new problems. The aim of the laboratory is thus to place at the disposal of those interested in the solution of physiological and neurological problems the best obtainable facilities for the prosecution of their work. In case one has not decided on a special line of research, the resources of the department are such that he will be given a fairly wide range of problems, from which he may select a subject suited to his tastes and attainments. A course

in biology, such as is given in our best colleges and State universities, is sufficient to enable students to begin work here.

It is proposed during the year to focus attention so far as practicable upon experiments relating to heredity, the influence of environment upon variation and upon the study of animal activity, normal rhythms of rest and work in a series of animals as related to structure and physiological condition of the nervous system. Incidentally this will include the gathering of data as to functions and work of animal species.

While no regular laboratory fees are charged, each student is expected to refund to the laboratory the cost price of all the more expensive reagents, including alcohol, ether, chloroform, formalin, celloidin, and the like. Each student must supply his own microscopical glass, slides and covers, and must pay the cost price of all glassware which he breaks. All students are expected to take the best possible care of all apparatus entrusted to their charge, and to return it to the laboratory clean and in good order.

The library of the department has been selected with two important considerations in view. The first of these has been to obtain the standard classics in the science. The second is to keep abreast of the times by having the best recent literature readily accessible both for study and reference. This latter class of selections thus includes monographs and text-books and current numbers of journals, with complete files of many of the more important. A complete set of indexes, Jahresberichte and Centralblätter greatly facilitates the work of referring to the literature of topics under investigation in the laboratory.

THE JOURNAL CLUB meets weekly, for the purpose of reporting and discussing important articles in the current periodicals.

A complete list of the Journals will be found in the *Publications* of the Library.

V.

ANTHROPOLOGY.

DR. CHAMBERLAIN will lecture twice a week throughout the year. The courses offered will be selected from the following :

A. GENERAL, embracing : (a) HISTORY, scope and relations of the science of Anthropology. (b) PHYSICAL ANTHROPOLOGY, Problems, investigations, results, laboratory work. (c) ETHNOGRAPHY. Races and race-origins. (d) ETHNOLOGY, INCLUDING SOCIOLOGY; origin and development of the arts and sciences; institutions; mythology; folk-lore; religions. (e) LINGUISTICS. Race and Language. Origin and development of language and of languages. Psychology of language. Gesture-speech and written language. Comparative linguistics. Comparative literature. (f) CRIMINAL AND PATHOLOGICAL ANTHROPOLOGY, Physical and Mental, Ethnic Morals. (g) HISTORICAL AND ARCHÆOLOGICAL. Primitive Man and Primitive Culture.

B. SPECIAL COURSES upon Anthropological Topics most akin to Psychology and Pedagogy, embodying the results of the most recent and important studies and investigations of the following and other subjects: The Physical Anthropology of Infancy, Childhood, Youth, Manhood, Old Age; The Anthropological Phenomena of Growth, Arrested Development, Degeneration; Anthropological Aspects of Heredity and Environment in the Individual and in the Race; Uncivilized Races and Civilized Races; The Phenomena of Race-Mixture; The Evolution Problems of Humanity; Education among Primitive Peoples; The Anthropological History of America; The Interpretation of Folk-lore; The Psychology of Primitive Peoples; The Trend of Human Progress; The Psychology of Primitive Languages; The Mind of Primitive Man and its Expressions; The Rôle of the Individual in Primitive Culture; Progress and its Criteria; The Orient and

the Occident in their Relations to Human Evolution ; The Negro in Africa and in America ; The American Indian.

The lectures in Anthropology will have special bearing upon the courses in Psychology and Pedagogy in the University, and every effort will be made to utilize the latest results of Anthropological investigations.

From time to time, the most valuable current literature will be reviewed and students made acquainted with the best contributions to Anthropological Science in the various foreign languages. The importance of a thorough acquaintance with the bibliography of their subjects is impressed upon all students, and all possible assistance in this direction is always at their disposal.

VI.

PSYCHOLOGY.

A complete course in Psychology at Clark University includes the following subjects:

I. Anatomy and Physiology of the Brain and Spinal Cord; senses, and other parts of the body, especially the muscles, the organs of the will, so far as they affect psychological powers and processes, with a good general background of biology. For this a special laboratory is equipped. See Dr. Hodge's announcement.

II. Physiological and Experimental Psychology, including Reflex Action; Fatigue and Rest; Sleep; Hypnotism; Automatism; Temperaments; Interaction of mind and body generally. Laboratory methods and apparatus for the study of the Senses, Reaction-time, Memory, Attention, Association, Will, Feelings, etc. For this a special laboratory is equipped. See Dr. Sanford's announcement.

III. Comparative and Genetic Psychology. Observation and experiments upon the mental processes of lower animals, including both microscopical and larger forms, and especially (when practicable) the observation of dawning intelligence during animal infancy; questions of instinct and psychical heredity; and the parts of the general field common to biology and psychology. See announcements of Dr. Hall and Dr. Sanford.

IV. Abnormal and Morbid Psychology, as nature's experiments, *e. g.*, Border-line phenomena as seen in neurotic people, prodigies, and geniuses; Defectives, such as the blind, deaf, criminal, idiotic; Mental and Nervous diseases, epilepsy, phobias, neurasthenia, hysteria; Morbid modifications of will, personality and emotion, etc. Special clinical facilities for this work are open to the department in the hospitals and other institutions of the city. See Dr. Hall's lectures and Dr. Cowles's lectures and clinic.

V. Anthropological Psychology; Myths, Custom and Belief, Comparative Religion and Psychology of Religion, Primitive

Art, and the study of the life of savages and children; Adolescence and senescence; Physical measurements illustrating laws of growth in size and power, etc. See Dr. Chamberlain's courses.

VI. *Æsthetics and Ethics*, the psychology of music, painting, literature, the phenomena and laws of volition and morality.

VII. *History of Psychology and Philosophy*, including the chief culture institutions, science, medical theories, Christianity, and education generally. Dr. Hall's historical courses and seminary.

VIII. *Applications of Psychology, Pedagogy*, including mental and moral hygiene and regimen, school organization and methods from kindergarten to university; the sex problem; defectives, etc. Dr. Hall's and Dr. Burnham's courses.

The aim of the Psychological Department is to cover this field as well as its instructors are able to do so in two or three years.

THE PSYCHOLOGICAL LABORATORY consists of a suite of eleven rooms on the third floor of the main building, devoted to the following purposes: 1, Lecture Room; 2, Large Dark Room; 3, Seminary and Departmental Library; 4, Office of Director; 5, Apparatus and preliminary setting up of apparatus; 6, 7 and 8, Rooms for demonstration and research; 9, Shop; 10, Photographic Dark Room; 11, Room for the keeping of animals and for Comparative Psychology. In floor space and favorable situation the Laboratory leaves little to be desired.

The department is well supplied with apparatus for both demonstration and research, and has access also to the collections of the physical and biological departments, and that of the psychological department of the College. Many pieces have been manufactured at the University and a considerable number have been designed here for special researches. The collection is constantly increasing by purchase or construction, especially in apparatus for research.

The Psychological section of the Library is full on EXPERIMENTAL AND PHYSIOLOGICAL PSYCHOLOGY, and upon THE PSYCHOLOGY OF RELIGION and the STUDY OF CHILDREN. The section on criminology and related topics is also large. All the more important psychological journals in English, French, German and Italian are received regularly at the University and complete sets of the most important are upon the shelves of the library.

The following courses are announced for the academic year 1906-1907.

DR. HALL'S COURSES.

Dr. G. Stanley Hall will give the following courses:

I. THE HISTORY OF MODERN PHILOSOPHY.

II. THE DEVELOPMENT OF MIND IN ANIMALS, CHILDREN AND THE RACE. This will be a review course, more by conference than by lecture. It will cover all the main lines needed for child study, a demonstration of the literature on each topic, and also the logic and methodology of the various kinds of work.

III. THE PSYCHOLOGY OF RELIGION AND OF CHRISTIANITY. This course will be more amplified and cover different ground from that of past years.

IV. THE HISTORY OF EDUCATION, beginning in the Orient, and including the education of primitive people and the philosophies of education.

V. SYSTEMATIC PSYCHOLOGY FROM AN EVOLUTIONARY AND EMPIRICAL STANDPOINT, beginning with Sensations.

VI. SEMINARY, at his home, three hours every Monday evening, through the year.

VII. RESEARCH.

DR. SANFORD'S COURSES.

The following courses or their equivalents will be given by Dr. Sanford:

A. EXPERIMENTAL AND COMPARATIVE PSYCHOLOGY.

1. *Comparative Psychology. The Evolution of mind in the race and the individual.* General theory of evolution; review of the facts of psychogenesis; discussion of special problems. One hour a week, throughout the year.

2. *Psychological Seminary.* Short lecture courses on special topics. Readings from the psychological classics. Reports and discussions on topics of current psychological interest. The work in the Seminary is informal and is varied to suit the needs of those attending it. One hour a week, throughout the year.

3. *Laboratory Practice Course.* Introduction to the use of standard pieces of apparatus and established methods. Informal lectures and laboratory practice. Four hours a week, second half year.

4. *Research.* Advanced students are directed [in research upon topics in Experimental and Comparative Psychology by Dr. Sanford. The laboratories are opened for advanced work at times suited to the convenience of those engaged in it.

B. SOCIAL PSYCHOLOGY.

Work on this topic will consist of informal lectures, conferences and assigned reading. One hour a week, throughout the year. The course is intended primarily for those desiring to make psychology a minor subject for the Master's degree.

C. GENERAL PSYCHOLOGY.

Students of Pedagogy and others desiring a general and elementary account of the subject are admitted, without extra expense, to the work of the Collegiate Department of Psychology.

PSYCHIATRY.

Dr. Cowles, former head of the McLean Hospital at Waverley, Mass., lecturer on psychiatry, will give a course at the University and clinical demonstrations at the Worcester Insane Hospital.

Dr. Cowles's course for the year 1906-1907 includes the following topics:

1. The dependence of psychiatry upon psychology as essen-

tially the study of mental function and its disorders in the domain of physiology.

2. The relation of psychology and psychiatry to the prevailing morphological conceptions of general medicine and the difficulty of harmonizing them.

3. Mental physiology; imperative ideas, obsessions, and psychological automatism.

4. The mental symptoms of nervous exhaustion. Forms of mental diseases—(mental symptoms essentially constituting the disease-forms).

5 and 6. The "symptomatic and functional" psychoses (not tending to dementia). The phases of "melancholia" and "mania;" "confusional insanity."

7 and 8. The deteriorating psychoses (tending to dementia), Dementia præcox (hebephrenic, katatonic, and paranoid forms), Paresis, Senile dementia.

9. The chronic psychoses (not tending to grave dementia). Involution psychosis. Primary delusional insanity,—paranoia.

10. Insanities from Mental Defect. Imbecility, Idiocy, Moral insanity.

DR. COWLES'S lectures are open without fee:

(1) To all members of the Faculty of the University and College;

(2) To all members of the Psychological Department, and to members of the College who are taking other psychological courses in the University.

The fee for all other persons is \$5.00.

During the current year, DR. GEORGE E. PARTRIDGE has lectured on

The Development of Psychological Theory.

VII.

EDUCATION.

This department offers a course which can be taken as a minor for the degree of Doctor of Philosophy. Its work is in the closest connection with that of psychology and anthropology, and in part based on these subjects. The work in this department is intended to meet the needs of the following classes of students.

First. Those intending to teach some other specialty, but who wish a general survey of the history, present state, methods, and recent advances in the field of university, professional and technical education.

Second. Those who desire to become professors of pedagogy, or heads or instructors in normal schools, superintendents, or otherwise to become experts in the work of education.

The programme of the Educational Department includes courses upon the following subjects:

I. (a) CHILD STUDY. (b) EDUCATIONAL PSYCHOLOGY. (c) SCHOOL HYGIENE.

II. (a) PRINCIPLES OF EDUCATION. (b) HISTORY OF EDUCATION AND REFORMS. (c) METHODS, DEVICES, APPARATUS, ETC.

III. (a) ORGANIZATION OF SCHOOLS IN DIFFERENT COUNTRIES. (b) THE TEACHING PROFESSION. (c) MOTOR EDUCATION, including manual training, physical education, etc. (d) MORAL AND RELIGIOUS EDUCATION. (e) IDEALS.

The courses in Education for 1906-1907 will be as follows:

DR. BURNHAM'S COURSES.

A. PEDAGOGICAL APPLICATIONS OF PSYCHOLOGY. Some of

the most important chapters in psychology in their educational aspects, such as habit, attention, interest, memory. The correlation of physical and psychic processes. Education of the senses. Apperception and association. Diseases of memory. Experimental investigations of memory. The learning process. Economical methods of learning. Feeling and interest in relation to instruction and training. The instincts of children as the basis of apperception and interest. Suggestion as a factor in education. The training of the will. Mental diseases and faults of school children. Neuroses of development. Psychological contributions to the hygiene of instruction. The point of view is that of genetic psychology. *One hour a week, throughout the year.*

B. THE HYGIENE OF INSTRUCTION. Mental hygiene and the hygiene of instruction. The laws of nervous activity in relation to problems of instruction. Fatigue. The period of study. The hygiene of the kindergarten. The hygiene of spelling, reading, writing, arithmetic, manual training, physical training, etc. The hygiene of grading. The hygiene of discipline, of punishment, etc. *One hour a week, throughout the year.*

C. SEMINARY. The work will be determined in part by the needs of the students who elect this course. It will probably be devoted chiefly to some phase of the history of education. It is hoped, also, that each student will select, after consultation with President Hall and Dr. Burnham, a topic for special investigation. The results of such studies may be published. *One or two hours a week throughout the year.*

PRESIDENT G. STANLEY HALL'S COURSE.

THE HISTORY OF EDUCATION, beginning in the Orient and including the education of primitive people and the philosophies of education.

This and Dr. Burnham's Saturday work constitute a special course open to teachers as well as to members of the University.

The courses as announced above may be modified somewhat as the needs of the students or other circumstances may require.

The library of the department has a large collection

of EDUCATIONAL LITERATURE, being especially rich in German and French literature, and having a large number of official reports from various countries—English, French, German, Belgian, Swedish, etc.; also town and city reports, and reports of special institutions; and a collection of French, German, and American text-books.

The books are arranged under the following heads:

1. GENERAL.
2. HISTORY OF EDUCATION.
3. EDUCATIONAL SYSTEMS.
4. THE THEORY OF EDUCATION AND SPECIAL SCHOOL SUBJECTS.
5. EDUCATIONAL PSYCHOLOGY.
6. CHILD STUDY.
7. SCHOOL HYGIENE AND PHYSICAL EDUCATION.
8. TEXT-BOOKS.
9. MISCELLANEOUS.

Many of the more common educational books are accessible in the Worcester Public Library and have not been duplicated by the University. The large collection of educational text-books in the library of the American Antiquarian Society and its valuable historical material are also accessible to the University.

The collection of educational periodicals includes a large number of the best foreign journals—English, French, German, Swedish, etc.

The nucleus of an educational museum has been formed, which contains a valuable collection of EDUCATIONAL APPARATUS, pictures and other material for language lessons and *Anschaunungsunterricht*, maps, charts, diagrams, models, illustrative material in school hygiene, etc.

The *Pedagogical Seminary* is a journal issued at the University, and serves as a convenient medium of pub-

lication for special investigations undertaken in the department.

SPECIAL STUDENTS IN EDUCATION.

In addition to the members of the University, special students are admitted during the year to the Saturday courses of Drs. Hall and Burnham in Education, for a fee of \$20.

VIII.

ECONOMICS AND SOCIOLOGY.

The degrees of Master of Arts and Doctor of Philosophy will be offered in this department both in Economics and in Sociology.

The degree of Master of Arts will be given both in Economics and in Sociology for the completion with credit of a course of study approved by the department. Such a course may be composed of a major in Economics and a minor in History, or of a major in Sociology and a minor in Psychology. The requirements, however, will be made sufficiently elastic to suit the needs of individual students.

For the degree of Doctor of Philosophy in either Economics or Sociology, the courses enumerated below, or their equivalents, will be accepted as the major requirement. Students expecting to take the degree in Economics, however, are advised to do their minor work in History; and students expecting to take the degree in Sociology are advised to do their minor work in Psychology, Anthropology, or Biology. The minor work will constitute about one-third of the work required.

The ability of students to do satisfactory research work will always be considered the most important qualification for the Doctor's degree.

Within a period of three years all the following courses will be offered, with which the student may satisfy the major requirements for the Doctor's degree, and each year such courses will be given as the interests and needs of the students require.

1. Advanced Theory of Economics.
2. History of Economic Theory.
3. Theory and Use of Statistics.
4. Labor Problems, including Labor Legislation.
5. Theory of Sociology. (See announcement in Collegiate Department.)
6. Literature of Sociology, including the leading theories of the present day.
7. Social Problems, including suicide, divorce, migration of population, fecundity of population, intemperance, pauperism, crime, etc.
8. History of the Theories of Socialism and Communism.
9. Scope and Method of the Social Sciences.
10. Seminary.

For the year 1906-1907 the following courses are offered.

BY PROFESSOR WRIGHT.

3. THEORY*AND USE OF STATISTICS.

Population: Its composition; Immigration; Arrears, urban and rural; Births; Deaths; Marriages; Divorces.

Statistics of Crime: Pauperism; Benevolences, etc.

Statistics of Agriculture: Commerce; Finance.

Statistics of Manufactures: Capital; Products; Cost of Production; Efficiency of labor; Labor cost, etc.

Wage Statistics: Difficulties attending them; Money wages; Real wages; Cost of living; Rates and earnings; Purchasing power of money.

4. LABOR PROBLEMS.

Under this general title the various features and elements of industrial society will be discussed; including Systems of labor; Evolution of manufactures; The factory system; The regulation of industry by states and individuals; Communism; Municipal socialism; Social democracy and state socialism; Strikes and lockouts; Industrial conciliation and arbitration; Government by injunction; Employers' liability and other features of the labor problem.

10. SEMINARY.

BY DR. BUSHEE.

5. **THEORY OF SOCIOLOGY.** (See announcement in Collegiate Department.)

And one or more of the following courses:

1. **ECONOMIC THEORY** during the 18th and 19th Centuries. The theories of the early economists will be studied with reference to the economic conditions under which they were formulated. The major part of the course, however, will be devoted to recent economic literature and to the present trend of economic thought. *2 hours.*

6. **LITERATURE OF SOCIOLOGY.** In this course a critical examination will be made of the contributions of the leading sociologists beginning with Auguste Comte, with reference both to their general theories and to their special contributions to the science of Sociology. Other authors to be studied will include Spencer, Ward, Giddings, Loria, De Greef, Gumpłowicz, Coste, Durkheim, Kidd, Tarde, and Simmel. This course presupposes a knowledge of the general principles of Sociology. Those who have not had such preparation may advantageously take the introductory course given in the Collegiate Department. *2 hours.*

7. **SOCIAL PROBLEMS**, including suicide, divorce, migration of population, fecundity of population, intemperance, pauperism, crime, etc.

8. **SOCIALISM AND COMMUNISM.** This course will consist in an historical survey of the theories of the leading Utopian and scientific Socialists and in a critical examination of the practical experiments in Communism which have been made in the United States and in foreign countries. Special attention will be given to the development of the three leading principles of scientific socialism, the materialistic conception of history, the theory of value, and the class-conscious struggle. These principles will be studied as represented by Marx, Engels, Kautsky, Bebel, Vandervelde, Labriola, Bernstein, Vollmar, Jaurès, and by the English Fabians. *2 hours.*

10. **SEMINARY IN ECONOMICS AND SOCIOLOGY.** Students entering the Seminary will be directed in research work in topics in Economics or in Sociology. Special subjects outside of the regular courses will be discussed and some of the periodic literature will be reviewed.

IX.

HISTORY.

Dr. Blakeslee will offer the following courses :

1. CONTEMPORARY HISTORY.

Students who wish to do graduate work in history will be expected to possess a sufficiently broad knowledge of the general field so that they may be able, with intelligent appreciation, to take up the study of special topics. The subjects to which the department will give particular attention are those which have a real importance at the present day. The students may gain the necessary information in the various subjects from the lectures and from extended reading ; the preparation of papers, reports, and theses will give the training which will enable them to take up any new historical subject which may challenge public attention, present its important features clearly and accurately, and show its relations to the events and the great world movements of the past.

In 1905-06 the subjects studied were : Tibet,—political, religious, and ethnical significance ; Russia,—political, social, and constitutional development, with emphasis upon the causes which brought about the recent revolution ; and the Congo Free State, particularly a critical study of the evidence relating to King Leopold's misgovernment.

In 1906-07 the topics treated will probably be : the history of the American Negro and the present Negro problem ; the Awakening of China,—its international relations and recent social and cultural development ; and the Colonial Possessions of the United States, including a sketch of the history of the Dutch, Spanish, and Portuguese colonies, and a comparison of their problems, successes, and failures with those of the United States in the Philippines and Porto Rico.

Each year one of the following courses will also be given :

2. INTERNATIONAL LAW.

The aim of this course will be to give a knowledge of the gen-

eral principles of International Law. So far as possible definite cases will be studied, and for that purpose Scott's "Cases on International Law" will be followed. Especial attention will be paid to the legal questions involved in the Russian-Japanese controversy; to the history and present status of arbitration; and to the modification in International Law introduced by such international Congresses as those held at the Hague. The study of leading authorities and cases will be supplemented by lectures, discussions and thesis work.

3. ENGLISH HISTORY—the Period of the Tudors and the Stuarts.

The course will extend from the accession of Henry VII, in 1485, to the death of Queen Anne, in 1714, and will deal especially with the establishment of practical absolutism under Henry VII and Henry VIII; the rise of Protestantism; the development of Puritanism in State and Church; the great Civil War; Cromwell and the Puritan Ascendancy; the attempts to form a firm constitutional government; the relation of English Puritanism to that of Switzerland and New England; the restoration of monarchy; and the final triumph of Parliament in the overthrow of James II.

4. THE HISTORY OF THE CHRISTIAN CHURCH.

This course will give a general history of the Christian Church from the days of the Apostles up to the present time. The leading topics considered will be: the pre-Constantine church, including the persecution and the formation of a definite ecclesiastical organization; the effects upon the church of Constantine's conversion; the Nicene Creed and the early heresies; the conversion of the barbarians and its reflex action upon the church; Monasticism; the rise of the Papacy; the Mediæval Church at its height; the rise of heresy—Wyclif, Huss, Savonarola; the reformation—Luther, Zwingli, Calvin; the Catholic Reformation; the religious wars of the sixteenth and seventeenth centuries; the Puritans; and a survey of the history of the leading Protestant denominations. The purpose of the course will be to give a clear conception of the history of the church as a whole, not to deal in detail with any single period.

5. ECONOMIC HISTORY OF EUROPE.

The aim of the course will be to give a general account of the

rise and development of the leading economic and social institutions of Europe. Some of the subjects considered will be: the manor; the different systems of land holding; serfdom; the merchant and craft guilds; the domestic and factory systems of industry; town life and the Hanseatic League; the rise of commerce and the struggles for world commercial supremacy; and the economic importance of colonies. Especial attention will be paid to English conditions. This course will be of particular assistance to students electing in economics.

6. UNITED STATES HISTORY. Different subjects for this course may be taken in succeeding years. For 1906-7 the period studied will be the history of the United States from the Missouri Compromise to the outbreak of the Civil war, with especial emphasis upon the years following the compromise of 1850. Students will be expected to present reports upon topics assigned by the instructor; these reports will then form the basis for a critical discussion.

In 1905-6 course 1 was given; in 1906-7 course 6 will probably be offered.

X.

MODERN LANGUAGES AND LITERATURE.

The degree of Master of Arts will be given in either German or French upon the satisfactory fulfilment of the following requirements.

1. A general knowledge of the history of either French or German literature. It is intended that this shall include not only a familiarity with the characteristic features of the main literary movements, but also a first-hand acquaintance with the chief masterpieces of the various epochs. To this end standard translations of the principal works, especially those of the older periods, are made accessible to the student and it is expected that he will supplement the work in his special field with extensive reading in the productions of other epochs.

2. The detailed study of some special period in the literature chosen.

3. The presentation of an acceptable thesis on a subject taken from the student's special field.

4. The ability to read and write the language chosen as major subject, with fluency and correctness.

The courses announced below are intended to furnish the basis for the special work of the candidate. One in German and one in French will be offered each year, the choice to depend upon the needs or desires of the candidates. In addition, the advanced courses in German and French regularly offered in the Collegiate Department are open to candidates for the degree of Master of Arts in Modern Languages. It is expected that the candidates will avail themselves of these as far as may be necessary.

Dr. Capen offers the following courses :

GERMAN.

GOETHE'S LIFE AND WORKS.

LESSING AND SCHILLER. Their lives and principal writings. Lessing's critical works and Schiller's philosophical essays will receive special attention.

HISTORY OF THE GERMAN DRAMA. A consideration of the main epochs of the German drama from its origin down to the work of contemporary dramatists. Particular attention will be paid to the development of dramatic form and to the work of the principal theorists.

SEMINARY. One of the following topics will be chosen for the work of the seminary:

1. The German Drama in the Nineteenth Century.
2. The German Novel in the Nineteenth Century.
3. The Modern Tragedy. The principal works of the modern French, German, Norwegian, Russian and English tragic writers, their choice and treatment of tragic themes will be studied.

FRENCH.

THE FRENCH NOVEL IN THE EIGHTEENTH AND NINETEENTH CENTURIES.

THE ROMANTIC MOVEMENT IN FRANCE. The development of lyric poetry, the novel, the drama and literary criticism.

FRENCH LITERATURE IN THE SECOND HALF OF THE NINETEENTH CENTURY. Realism, Naturalism, Symbolism and contemporary tendencies.

The attention of students in other departments of the University is called to the following undergraduate courses:

SCIENTIFIC GERMAN. The aim of this course will be to aid students in scientific departments to acquire a fair reading knowledge of scientific German. The first part of the course will consist of a brief review of the forms and syntactical principles of the language, accompanied by the reading of some popular scientific works of general interest, such as Helmholtz's *Populäre Vorträge*, or Wagner's *Entwickelungslehre*. In the latter part of the course more specialized scientific reading in his own field will be assigned to each student, under the direction of the instructor. *Two hours a week.*

SCIENTIFIC FRENCH. Students of the University who desire to gain facility in reading scientific French may meet the instructor at stated periods for direction and assistance.

Students who have no knowledge of German or French may find it advisable to enter the elementary courses in those languages given in the Collegiate Department.

XI.

ENGLISH.

Dr. Hoyt offers the following courses to candidates for the degree of Master of Arts :

CHAUCER AND SHAKESPEARE. This course traces the growth of their literary power, and endeavors to give a just appreciation of their important works.

SEMINARY IN ENGLISH COMPOSITION. The aim of the course is two-fold :—to give a clearer insight into literary values by the criticism of classroom work as well as of standard authors, and to offer a wide practice in original composition.

CONTEMPORARY LITERATURE. The lectures will deal with the best contemporary work in the essay, the short story, the novel, drama, and poetry.

SEMINARY. The work of this seminary is distinctly individual in character. Each student is urged to choose some topic of special interest to him, and to devote his time to the literature and criticism bearing upon his subject, presenting his results for discussion in this weekly seminary, and giving his final conclusions in the form of a thesis. The greatest freedom of choice is allowed the student to develop, if possible, any latent literary ability.

ENGLISH LITERATURE. A Saturday course in English Literature will also be offered, which will be open to the public at the usual fee. The ground covered by the lectures will be determined by the wishes and needs of the class.

LIBRARY.

The Library is under the control of a Library Committee, appointed by the Trustees, of which the President of the University is *ex-officio* chairman. The duties of this committee are to advise concerning the arrangement, cataloguing, use of books, and other matters pertaining to the Library not reserved to the Trustees nor otherwise provided for.

LIBRARY COMMITTEE.

PRESIDENT G. STANLEY HALL, *Chairman*,
PRESIDENT CARROLL D. WRIGHT,
PROFESSOR WILLIAM E. STORY, *Secretary*.

LIBRARY STAFF.

LOUIS N. WILSON, *Librarian*.

Assistants.

| | |
|--------------------|----------------------|
| EDITH M. BAKER, | ALICE M. PRENTICE, |
| JENNIE L. KNIGHT, | MARY S. TERWILLIGER, |
| ALBERT J. PECKHAM, | MARY D. THURSTON. |

The Library building is situated on the corner of Main and Downing streets. The Public Opening of the new building was held January 14th, 1904. A full description of the building and of the Proceedings at the Opening will be found in the *Publications of the Clark University Library* for April, 1904 (Vol. 1, No. 3).

The College Library and study rooms are located in the rooms formerly occupied by the University Library in the Main Building.

The Library contains about 35,000 bound volumes

and 1,500 pamphlets, and the reading-room receives over 200 journals.

The books are grouped as follows :

| | |
|--|--------------------------------------|
| A WORKS OF GENERAL REF- ERENCE. | L BIOGRAPHY. |
| B JOURNALS. | M ANTHROPOLOGY. |
| C MATHEMATICS. | N EDUCATION. |
| C D MATH.-PHYSICS. | O GENERAL SCIENCE. |
| D PHYSICS. | P HISTORY. |
| E CHEMISTRY. | Q LAW. |
| F BIOLOGY, ZOOLOGY, BOT- ANY, PHYSIOLOGY, NEU- ROLOGY. | R POLITICAL AND SOCIAL SCI- ENCE. |
| G GEOGRAPHY. | S ENGLISH. |
| H PATHOLOGY. | T MODERN LANGUAGES. |
| I PSYCHOLOGY. | U CLASSICS. |
| J PHILOSOPHY. | W PRACTICAL ARTS. |
| K RELIGIOUS PSYCHOLOGY | X LIBRARY SCIENCE. |
| | Y ART. |
| | Z MANUSCRIPTS. |

Books not included under any of these subjects are grouped as Miscellaneous, and marked according to their case, tier and shelf.

Particular attention is paid to the needs of students engaged in research work. The library already possesses a good collection of complete sets of the best scientific periodicals. It makes liberal purchases for individual needs and supplements these by drawing upon the resources of the older and larger libraries through the inter-library loan system. During the past year 310 volumes were borrowed from, and 146 volumes lent to, other libraries. The number of books added each year is about four thousand volumes.

The publications of the library, edited by the Librarian, and commenced in October, 1903, are as follows:

No. 1. WILSON, LOUIS N.:

*Bibliography of the Published Writings of President
G. Stanley Hall.* Oct., 1903.

- No. 2. WILSON, LOUIS N.:
Bibliography of Child Study for the Year 1902.
 Jan., 1904.
- No. 3. *Proceedings and Addresses* at the Public Opening of the
 Library Building of Clark University, Thursday, Jan-
 uary 14, 1904. Apr., 1904.
- No. 4. WILSON, LOUIS N.:
Bibliography of Child Study for the Year 1903.
 July, 1904.
- No. 5. WILSON, LOUIS N.:
Preparing Manuscript for the Press. Jan., 1905.
- No. 6. *Founder's Day*, Clark University. Apr., 1905.
- No. 7. WILSON, LOUIS N.:
Bibliography of Child Study for the Year 1904.
 July, 1905.
- No. 8. DE PEROTT, JOSEPH:
*The Probable Source of the Plot of Shakespeare's Tem-
 pest.* Oct., 1905.
- No. 9. *Proceedings and Addresses* at the Public Opening of the
 Art Department of Clark University. Dec., 1905.

The department of religious psychology, established within the past two years, has grown rapidly and now supports *The American Journal of Religious Psychology and Education*, of which three numbers, constituting Volume 1, have already appeared, and of which the first number of Volume 2 is now in press.

The books in the Art Department are accessible on application to the librarian, but, by the terms of the Founder's will, they cannot be taken from the building.

All the privileges of the library are open to all members of the University, and each member has direct access to every book and journal.

The library is open from 8 A. M. to 6 P. M.

Outside the University are found:

The Library of the American Antiquarian Society,

organized in 1812, and containing over 120,000 volumes, is accessible to all members of the University.

The Worcester Public Library, containing 590 newspapers and magazines and 153,000 volumes, has, in the past, to some extent supplemented the scientific publications purchased by the University, and all its privileges are accessible without charge.

The Library of the Worcester District Medical Society of over 10,000 volumes is also free to all members of the University.

LIBRARY RULES.

No loud talking is allowed in any part of the Library.

Every book shall be returned at the end of one calendar month from the time at which it was taken out, but may be called in at any time at the discretion of the Librarian.

Current numbers of periodicals shall not be taken out until they have been in the Library ten days.

All dictionaries, cyclopædias, and books of general reference are permanently reserved.

Reserved books and current numbers of periodicals, exempt from circulation, may be taken out after 5.30 P. M., but must be returned before 9 o'clock the next morning, excepting that such books and periodicals may be taken out Saturdays at 12 o'clock M., and may be kept until 9 o'clock the next Monday morning.

Readers must not write or make any mark upon any book, manuscript, map, or other property belonging to the Library.

Any breach of the above Rules will involve suspension of the Library privileges until personally restored

by the Librarian. All such cases shall be laid before the Library Committee at their next meeting.

ART DEPARTMENT.

In his last will and testament the Founder of the University bequeathed

“the sum of \$100,000 as an endowment fund for the Art Department of said University, and said sum is to be held and kept sacred and intact as a principal not to be used or expended under any conditions, but the income, interest or proceeds thereof shall be used only in putting and keeping said works of art or others given or obtained for said department in good condition and in taking care of them ; and then if there is a surplus of the income of said fund left, I will and direct that it be used in the purchase of additional works of art or of such matters as will add to the usefulness and efficiency of said Art Department.”

Under these conditions a large room has been furnished and equipped on the upper floor of the Library Building. Upon the death of Mrs. Clark, those of the Founder's collections that were deemed most suitable for this purpose were arranged and displayed in this room, together with his most valuable books, which, by the conditions of the will, cannot be removed from the building. A complete catalogue of these books and paintings will be published in the PUBLICATIONS OF THE LIBRARY at an early date. A Curator and Custodian of them have been appointed by the Board (see page 92) and all are now accessible to visitors. The Art Department is open daily (except Sundays) from 9 A. M. to 5 P. M.

REGULATIONS.

1. All requisitions for apparatus must be made through the Bursar's office upon printed blanks provided for that purpose, and signed by a member of the staff.

2. So far as possible, orders for only the kind and amount of apparatus certain to be used during the year shall be placed; nothing shall be ordered for future years, and apparatus for research shall take precedence over that for teaching and illustration only.

3. Requisitions for repairs, furniture, plumbing and work about the buildings must be made through the Bursar's office in writing and with detail, and when once passed upon, no change involving additional expense can be made in the requisition without the consent of the Finance Committee.

4. No unappropriated rooms and no part of the University grounds shall be used for any purpose, and appropriated rooms shall not be used for other purposes than the stated University work for which they were intended without previous permission from the office.

5. Unless for special reasons, absence of instructors from their stated exercises or from town for two consecutive week days, in term time, should be announced at the office, and for longer absence permission should be obtained beforehand.

6. The Trustees desire that no instructor, Docent, or Fellow shall enter upon other engagements outside his proper work in the University of a kind or amount

likely to lessen his full efficiency for science within the University.

The following additional rules were passed by the Board of Trustees, at a meeting held April 4th, 1891, to take effect for the next academic year.

7. Appropriations shall hereafter cover all apparatus and supplies of whatever nature for laboratories, for demonstration or illustration; all metal and carpenter work connected with the scientific activity of each department; and every form of special service. Appropriations, however, shall not hereafter cover books or journals, which shall be submitted to the Library Committee.

8. The several appropriations made to individual instructors and others shall be the full and fixed limit of the liability of the University, to be on no account transcended, and for every excess over the appropriations, from whatever cause, the instructor making the order shall be personally responsible.

9. No order for any purpose shall be paid by the University, whether on appropriations or for general supplies, that has not passed through the Bursar's office.

At a meeting of the Board of Trustees, held January 17, 1905, the following additional rules were enacted:

10. The President, Professors, Assistant Professors and regular Instructors authorized by the Board to do graduate work, together with the Librarian, shall constitute the Faculty of the University. Its meetings shall be called and presided over by its President, or, in his absence, by a Professor whom he shall designate. The Faculty shall elect a Secretary and its records shall always be accessible to the Trustees. Its jurisdiction

shall include all matters pertaining to the instruction, conduct and discipline of students, and such other duties as may be prescribed by the Trustees.

11. The President of the University shall make at the October meeting an annual report on the condition of the departments and their work during the year and shall have authority to require and receive from all instructors and officers of the University and Library such reports as he may deem necessary. A copy of these reports, including that of the Library, shall be deposited with the Mayor of the City.

12. The University Faculty shall have the oversight of all graduate work and shall recommend for the Master's, Doctor's and all other graduate degrees upon such terms, conditions, and forms as it may determine, and exercise such other functions and responsibilities as are not expressly assigned to the Trustees or to the Collegiate Department.

13. The Custodian of the Art Collections shall have general oversight over its room in the Library Building and its contents, together with their care and use, under the direction and control of the Curator. The Curator shall from time to time submit to the Trustees his recommendations for the purchase of additional works of art from the income of the Art Fund, based on and together with the opinions of experts as to their value and desirability. All such purchases shall be approved by the Board of Trustees, or by such a committee of their members as they shall appoint for that purpose.

14. The President of the University shall make an annual report to the Trustees of the action of the Library Committee, of which he is Chairman, and this report if approved shall be filed and preserved.

DEGREES CONFERRED.

On June 21, 1905, the University conferred degrees upon the following persons :

MASTER OF ARTS.

ROWLAND HAYNES, June 16, 1905.
Dissertation : Religious Faith as an Individual Experience.

DOCTORS OF PHILOSOPHY.

REGINALD BRYANT ALLEN, May 25, 1905.
Dissertation : On Hypercomplex Number Systems Belonging to an Arbitrary Domain of Rationality.

CHARLES E. BROWNE, June 13, 1904.
Dissertation : The Psychology of the Simple Arithmetical Processes.
American Journal of Psychology, January 1906, Vol. 17, pp. 1-37.

W. FOWLER BUCKE, June 24, 1904.
Dissertation : Examinations and Grading.

ARTHUR L. CLARK, June 17, 1904.
Dissertation : Surface Tension at the Interface between Certain Liquids and Vapors.
Proceedings of the *American Academy of Arts and Sciences*, January 1906, Vol. 41, pp. 361-381.

JOSEPH GEORGE COFFIN, November 6, 1903.
Dissertation : Construction and Calculation of an Absolute Standard of Self-Inductance.
Bulletin of the Bureau of Standards, 1906, Vol. 1, No. 4.

JOHN S. FRENCH, March 28, 1899.
Dissertation : On the Theory of the Pertingents to a Plane Curve.

JESSE NEVIN GATES, July 1, 1904.
Dissertation : Cubic and Quartic Surfaces in Four-fold Space.

BENJAMIN SPENCER GOWEN, June 12, 1905.
Dissertation : Group Psychoses.

- JOHN CHARLES HUBBARD, June 18, 1904.
Dissertation: On the Conditions for Sparking at the Break
of an Inductive Circuit.
Physical Review, March, 1906, Vol. 22, pp. 124-158.
- HERBERT G. KEPPEL, June 13, 1901.
Dissertation: The Cubic Three-Spread Ruled with Planes
in Four-fold Space.
- WALTER LIBBY, June 14, 1905.
Dissertation: Poetic Imagination.
- THOMAS SCOTT LOWDEN, June 13, 1905.
Dissertation: A Study in Personal Hygiene.
Pedagogical Seminary, March, 1906, Vol. 13, pp. 1-60.
- JOSIAH MOSES, June 11, 1904.
Dissertation: Pathological Aspects of Religion.
- FRED MUTCHLER, June 13, 1904.
Dissertation: On the Structure and Biology of the Yeast
Plant.
Journal of Medical Research, November, 1905, Vol. 14,
pp. 13-50.
- MAURICE H. SMALL, May 8, 1905.
Dissertation: On Some Psychological Relations of Society and
Solitude.
Pedagogical Seminary, April 1900, Vol. 7, pp. 13-69.
- LEWIS MADISON Terman, June 13, 1905.
Dissertation: Genius and Stupidity.
- CHARLES W. WADDLE, June 16, 1905.
Dissertation: Miracles of Healing.
- ROY T WELLS, June 17, 1903.
Dissertation: Experiments on the Self-Induction of Cur-
rents in Cylindrical Cores.

The following gentlemen also have taken the examination
for the doctor's degree, but have not yet completed all the formal
requirements:

EUGENE W. BOHANNON,
WILLIAM F. BOOK,
ALVIN BORGQUIST,

A. CASWELL ELLIS,
MELANCHTHON F. LIBBY,
JAMES P. PORTER.

PUBLICATIONS RELATING TO THE UNIVERSITY.

A Register and Official Announcement is issued each year in February or March.

In the years 1890, 91, 92, and 1903, the annual Report of the President to the Board of Trustees was printed.

A Summer School has been held each year since 1892, with the exception of 1893, 1900, 1902, 1904 and 1905, and in such years a Summer School Programme has been issued.

In July, 1899, the University observed its tenth anniversary, and published the following volume :

Clark University, 1889-1899. Decennial Celebration, 8 x 11 in., pp. 566. Published for the University. Price, \$5.00. Contains the lectures delivered by Professors Picard, Boltzmann, Cajal, Mosso and Forel at the Decennial Celebration, July, 1899 ; also reports by the heads of departments on their aims and ideals, with a list of past and present members of the University and the titles of their published papers.

JOURNALS CONNECTED UNOFFICIALLY WITH THE DEPARTMENTS.

THE AMERICAN JOURNAL OF PSYCHOLOGY. This Journal was commenced in November, 1887, and is now edited by G. Stanley Hall, E. C. Sanford, and E. B. Titchener (Cornell University) with the assistance of an international board of co-operators. Each volume contains four numbers—issued in January, April, July and October. Besides original articles, a considerable portion of its space is devoted to careful digests of the

important literature in its field. Price, \$5 per volume ; single numbers, \$1.50. Florence Chandler, Publisher, Worcester, Mass.

THE PEDAGOGICAL SEMINARY. This Journal was begun in January, 1891, and is edited by the President of the University. It is an international record of educational literature, institutions and progress, and is devoted solely to the highest interest of education in all grades, with digests of important literature of all countries. It is the organ of the Educational Department of the University. Each volume contains four numbers—issued in March, June, September and December. Price, \$5 per volume ; single numbers, \$1.50. Florence Chandler, Publisher, Worcester, Mass.

THE MATHEMATICAL REVIEW. This journal, of which the first volume is in course of publication, is edited by William E. Story. Its scope includes original research in mathematics, résumés of subjects of a more elementary character, pedagogical and historical sketches, and bibliographical notices. Every volume will consist of four numbers of 96 pages each. Each number contains the portrait of some distinguished mathematician. Price, \$5 a volume. Published by the editor, Worcester, Mass.

THE AMERICAN JOURNAL OF RELIGIOUS PSYCHOLOGY AND EDUCATION. This journal was begun in May, 1904, and appears three times a year. It aims to give an account of all the more important books and periodicals in its field, which includes religious education, and prints original articles. Each number contains about 100 pages. Price, \$3.50 per volume, \$1.50 per number. Louis N. Wilson, Publisher, Worcester, Mass.

DEPARTMENT OF

Economics and Sociology

CLARK UNIVERSITY, WORCESTER, MASS.

The department of Economics and Sociology was organized at Clark University in 1905. Because of its recent origin some description of the department and announcement of its plans may be of interest. The department is under the direction of the Honorable Carroll D. Wright, President of the Collegiate Department, assisted by Dr. Frederick A. Bushee. The degrees of Master of Arts and Doctor of Philosophy are offered in both Economics and Sociology. The requirements for these degrees accord in general with those of the other departments of the University, and the high standard which has been maintained in the older departments will be insisted upon in this one.

Candidates for both degrees are required to do minor work in some allied department in addition to their major work in this department. Candidates for the degree of Master of Arts must show ability to carry on independent investigations. Candidates for the degree of Doctor of Philosophy must prove their ability to do research work by a thesis which makes a distinct contribution to social science. In every case ability to do research work is considered the most important requirement for the degrees.

The location of Clark University is particularly favorable for economic and sociological investigations. Worcester is a medium-sized city (130,000 inhabitants) with a variety of industries, large and small, and a cosmopolitan population. Hence the opportunities for local studies of industrial and social problems are excellent. State and municipal statistics are sufficiently detailed and accurate to give a basis for such local studies.

The University itself also offers superior advantages for the study of Sociology. Its different departments are closely coordinated, each offering courses intended to supplement the work of allied departments. Thus courses in Psychology, the course in Dynamic Biology and the courses in Anthropology form the natural groundwork for a thorough training in Sociology, while the course in Social Psychology to be offered next year may be considered as an integral part of the work in Sociology itself. Excellent library facilities are offered by the University library, which pays particular attention to the needs of research students. About four thousand volumes are added each year and about two hundred journals are received, including the leading economic and sociological reviews. The University library may be supplemented by the Worcester Public Library and the Library of the American Antiquarian Society.

During the past year two interesting investigations have been made by students in this department. One is a study of the causes of poverty in Worcester by the case counting method. One thousand cases from the records of the Associated Charities have been carefully analyzed, and the causes tabulated, with reference to nationality, size of family, head of family, etc. This study will make a valuable addition to our knowledge of the causes of poverty. It will be especially interesting to see whether these causes in a medium-sized city correspond to those already discovered in the large cities like New York and Chicago. Another study concerns juvenile crime and the treatment of juvenile offenders in Worcester, covering the actual working of the city's system from the boys' clubs and the courts to the truant and reform schools, and will attempt to draw some conclusions as to the results of the system used here and to compare it with the methods employed in other cities.

The courses offered in this department will be varied from year to year, but each year they will be adapted as far as possible to the interests and needs of individual students. The full number of courses offered will include the following:

1. Advanced Theory of Economics.
2. History of Economic Theory.
3. Theory and Use of Statistics.
4. Labor Problems, including Labor Legislation.

5. Theory of Sociology.

6. Literature of Sociology, including the leading theories of the present day.

7. Social Problems, including suicide, divorce, migration of population, fecundity of population, intemperance, pauperism, crime, etc.

8. History of the Theories of Socialism and Communism.

9. Scope and Method of the Social Sciences.

10. Seminary.

For the year 1906-1907 the following courses are offered.

BY PROFESSOR WRIGHT.

3. THEORY AND USE OF STATISTICS.

Population: Its composition; Immigration; Arrears, urban and rural; Births; Deaths; Marriages; Divorces.

Statistics of Crime: Pauperism; Benevolences, etc.

Statistics of Agriculture: Commerce; Finance.

Statistics of Manufactures: Capital; Products; Cost of Production; Efficiency of labor; Labor cost, etc.

Wage Statistics: Difficulties attending them; Money wages; Real wages; Cost of living; Rates and earnings; Purchasing power of money.

4. LABOR PROBLEMS.

Under this general title the various features and elements of industrial society will be discussed; including Systems of labor; Evolution of manufactures; The factory system; The regulation of industry by states and individuals; Communism; Municipal socialism; Social democracy and state socialism; Strikes and lockouts; Industrial conciliation and arbitration; Government by injunction; Employers' liability and other features of the labor problem.

10. SEMINARY.

BY DR. BUSHEE.

5. THEORY OF SOCIOLOGY. The aim of this course is to make a systematic presentation of the laws of social progress. The leading biological and psychological laws will be studied as they have been formulated by American and European writers. 2 hours.

And one or more of the following courses:

1. ECONOMIC THEORY during the 18th and 19th Centuries. The theories of the early economists will be studied with reference to the economic conditions under which they were formulated. The major part of the course, however, will be devoted to recent economic literature and to the present trend of economic thought. 2 hours.

6. LITERATURE OF SOCIOLOGY. In this course a critical examination will be made of the contributions of the leading sociologists, beginning with Auguste Comte, with reference both to their general theories and to their special contributions to the science of Sociology. Other authors to be studied

will include Spencer, Ward, Giddings, Loria, De Greef, Gumpłowicz, Coste, Durkheim, Kidd, Tarde, and Simmel. This course presupposes a knowledge of the general principles of Sociology. Those who have not had such preparation may advantageously take the introductory course given in the Collegiate Department. *2 hours.*

7. SOCIAL PROBLEMS, including suicide, divorce, migration of population, fecundity of population, intemperance, pauperism, crime, etc. *2 hours.*

8. SOCIALISM AND COMMUNISM. This course will consist in an historical survey of the theories of the leading Utopian and scientific Socialists and in a critical examination of the practical experiments in Communism which have been made in the United States and in foreign countries. Special attention will be given to the development of the three leading principles of scientific socialism, the materialistic conception of history, the theory of value, and the class-conscious struggle. These principles will be studied as represented by Marx, Engels, Kautsky, Bebel, Vandervelde, Labriola, Bernstein, Vollmar, Jaurès, and by the English Fabians. *2 hours.*

10. SEMINARY IN ECONOMICS AND SOCIOLOGY. Students entering the Seminary will be directed in research work in topics in Economics or in Sociology. Special subjects outside of the regular courses will be discussed and some of the periodic literature will be reviewed.

A number of fellowships and scholarships are available for promising students who need pecuniary assistance. These include University Scholarships, covering the tuition fee of \$100; Junior Fellowships, covering the tuition fee and yielding a stipend of \$100 additional; and Senior Fellowships, covering the tuition and yielding a stipend of \$200 additional.

May 14-06

CLARK UNIVERSITY

Saturday Courses for Teachers

ACADEMIC YEAR, 1906-07

Clark University offers to teachers, superintendents and principals, and to the public, as well as to students in all departments of the University, special courses of lectures on educational topics on Saturday mornings.

These lectures will begin Saturday, October 20th.

The courses are as follows:

COURSE I.

PRESIDENT CARROLL D. WRIGHT. (9-10 A. M. Room 51, Main Building. Saturdays throughout the year.)

STATISTICS AND SOCIAL ECONOMICS. Twelve lectures on the use of statistics; the balance of the course on applied economics, involving a discussion of present-day problems. The aim is to teach the principles, theory, and practice of the statistical method, illustrating its use and abuse in presenting data relating to population, production, commerce, wages, prices, crime, etc. Under social economics the course deals with principles of social economics, elements of industrial society, systems of industry, evolution of manufactures, the factory system, the regulation of labor, strikes, arbitration, effects of machinery, prison labor, cooperation, savings institutions, labor legislation, labor organizations, socialism, etc., etc.

The fee for this course alone will be \$10.00 for the entire year, or \$6.00 for each half year.

COURSE II.

PROFESSOR W. H. BURNHAM. (10-11 A. M. Room 71, Main Building. Saturdays throughout the year.)

EDUCATIONAL APPLICATIONS OF PSYCHOLOGY. In recent years very important contributions to education have been made by genetic and comparative psychology, physiological psychology, psychiatry, experimental psychology and experimental pedagogy. Such contributions are scattered throughout many periodicals and archives. The aim of this course will be to present certain topics in psychology from the modern point of view with illustrations from such studies. The course will treat some of the more important chapters in psychology in their educational aspects, such as habit, attention, interest, memory, etc. The correlation of physical and psychic processes. Education of the senses. Apperception and association. Diseases of memory. Experimental investigations of memory. The learning process. Economical methods of learning. Feeling and interest in relation to instruction and training. The instincts of children as the basis of apperception and interest. Suggestion as a factor in education. The training of the will. Mental diseases and faults of school children. Neuroses of development. Psychological contributions to the hygiene of instruction. Special topics in experimental pedagogy. Illusions of memory. Psychology of children's testimony. Psychology of questioning, etc. The point of view is that of genetic psychology and experimental pedagogy.

The fee for this course alone will be \$10.00 for the entire year, or \$6.00 for each half year.

COURSE III.

PRESIDENT G. STANLEY HALL. (11-12 A. M. Room 71, Main Building. Saturdays throughout the year.)

PRESENT EDUCATIONAL PROBLEMS IN DIFFERENT COUNTRIES. The present educational situation and prob-

lems in England, Scotland and Ireland, including a sketch of recent educational history as far as it sheds light on present problems; curricula and methods of teaching now in vogue for different topics; the training of teachers; educational leaders and their work; literature, law and statistics; characteristic individuals and institutions of each type. Special attention will be given to problems involving those points of organization and pedagogic method calculated to be of direct and immediate help to American teachers and superintendents in their daily work. There will be exhibitions of text-books and other literature, and personal aid to any desiring to work up special topics or prepare papers. Dr. Wilson, the Librarian, will cooperate with this work and assist with references, etc.

The educational organization and practice of Germany will be considered, as at present conducted, in the same way as that of Great Britain, from the kindergarten to the technical school and university. Here, as in each country, attention will be paid to special and accessory educational activities, such as evening classes, trade, apprentice and commercial schools. The relation of education to the present remarkable position of Germany in industry, trade, politics will be brought out with special reference to the question what this country can and should learn from Germany.

The system of France will be considered in the same manner. Here, besides the above points of view, the problems of religious education as now prominent in England, but which are approached from a very different point of view, will be described. The training of teachers, recent changes and new departures in school hygiene will be outlined.

Briefer accounts of education in Italy, Spain, Russia, Scandinavia, Canada, Mexico, Argentina, and perhaps one or two other leading South American states will follow.

Other lectures will deal with the present outlook in

Japan, China, India, and in various provincial and colonial lands, including Australia, etc.

This course will also include a summary account of education in the United States, comprising the school laws in the various states, and the various points of organization. This will be treated in a brief way to show our own relative position and what we can best teach and best learn from other lands.

As a whole, the course is a new one, although incidentally it includes the results of previous Saturday courses. It will be chiefly practical and deal with present living problems, although it will also involve brief sketches of educational history. The larger aspect of modern education as an unerringly dominant factor in the national welfare and progress will be constantly in view.

The fee for this course alone will be \$10.00 for the entire year, or \$6.00 for each half year.

The fee for all of the above courses will be \$20.00 for the entire year, or \$12.00 for each half year.

All fees for each and all of these courses are remitted to full members of the University and College.

The Library, both its educational and other departments, will be open gratuitously during the year to all who take any part of this work.

Those teachers, who may desire special aid in their work or in preparing papers, will receive assistance upon application to the instructors or to the librarian.

For further particulars address or consult

MISS FLORENCE CHANDLER

Clark University

Worcester, Mass.

Oct. 18-1906.



Clark University
in the City of Worcester
Massachusetts

Register and
Nineteenth Official
Announcement

1907

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* Deceased November 1, 1906

CLARK UNIVERSITY

WORCESTER, MASSACHUSETTS

REGISTER

AND

Nineteenth Official Announcement

WORCESTER, MASSACHUSETTS

PUBLISHED FOR THE UNIVERSITY

March, 1907

CALENDAR, 1907-1908

1907

| | | | |
|-------|----|----------|------------------------------------|
| APRIL | 1 | Monday | } Spring Recess |
| APRIL | 6 | Saturday | |
| APRIL | 19 | Friday | Patriots' Day |
| MAY | 30 | Thursday | Memorial Day |
| JUNE | 20 | Thursday | Eighteenth academic year closes |

Summer Vacation of 14 Weeks

| | | | |
|-------|----|----------|------------------------------------|
| SEPT. | 26 | Thursday | Nineteenth academic year begins |
|-------|----|----------|------------------------------------|

| | | | |
|------|----|----------|------------------|
| NOV. | 28 | Thursday | Thanksgiving Day |
|------|----|----------|------------------|

| | | | |
|------|----|-----------|--------------------|
| DEC. | 25 | Wednesday | } Christmas Recess |
| 1908 | | | |

| | | |
|------|---|----------|
| JAN. | 4 | Saturday |
|------|---|----------|

| | | | |
|------|---|----------|----------------|
| FEB. | 1 | Saturday | Founder's Day* |
|------|---|----------|----------------|

| | | | |
|------|----|----------|-----------------------|
| FEB. | 22 | Saturday | Washington's Birthday |
|------|----|----------|-----------------------|

| | | | |
|-------|----|----------|-----------------|
| MAR. | 30 | Monday, | } Spring Recess |
| APRIL | 4 | Saturday | |

| | | | |
|-------|----|--------|---------------|
| APRIL | 20 | Monday | Patriots' Day |
|-------|----|--------|---------------|

| | | | |
|-----|----|----------|--------------|
| MAY | 30 | Saturday | Memorial Day |
|-----|----|----------|--------------|

| | | | |
|------|----|----------|------------------------------------|
| JUNE | 18 | Thursday | Nineteenth academic year closes |
|------|----|----------|------------------------------------|

*Not a holiday

MEMBERS

STAFF

G. STANLEY HALL, PH. D., LL. D. 94 Woodland St.
President of the University and Professor of Psychology

A. B., Williams College, 1867; A. M., 1870; Ph. D., Harvard University, 1878; Lecturer in Harvard and Williams Colleges, 1880-81; Professor of Psychology, Johns Hopkins University, 1881-88; LL. D., University of Michigan, 1888; Williams College, 1889, and Johns Hopkins University, 1902; Curator of the Art Collection, Clark University. Resident member of the Massachusetts Historical Society.

WILLIAM E. STORY, PH. D. 17 Hammond St.
Professor of Mathematics

A. B., Harvard University, 1871; Ph. D., Leipzig, 1875; Parker Fellow (Harvard), 1874-75; Tutor of Mathematics, Harvard University, 1875-76; Associate, Assistant Professor, and Associate Professor of Mathematics, Johns Hopkins University, 1876-89; Professor of Mathematics, Clark College, 1902-. Member of the London Mathematical Society; Resident Fellow of the American Academy of Arts and Sciences.

EDMUND C. SANFORD, PH. D. 24 Richards St.
Professor of Experimental and Comparative Psychology

A. B., University of California, 1883; Fellow, Johns Hopkins University, 1887; Ph. D., Johns Hopkins University, 1888; Instructor in Psychology, Johns Hopkins University, 1888; Instructor in Psychology, Clark University, 1889-92; Assistant Professor, 1892-1900; Professor of Psychology, Clark College, 1903-.

ARTHUR G. WEBSTER, PH. D., D. SC. 66 West St.
Professor of Physics

A. B., Harvard University, 1885; Instructor in Mathematics, Harvard University, 1885-86; Parker Fellow, 1886-89; Student, Universities of Berlin, Paris, Stockholm, 1886-90; Ph. D., Berlin, 1890; Docent in Physics, Clark University, 1890-92; Assistant Professor, 1892-1900; Professor of Physics, Clark College, 1902-; D. Sc., Tufts College, 1905. Member National Academy of Sciences; Resident Fellow of the American Academy of Arts and Sciences.

HENRY TABER, PH. D. 65 West St.
Professor of Mathematics

Ph. B., Yale University, 1882; Ph. D., Johns Hopkins University, 1888; Assistant in Mathematics, Johns Hopkins University, 1888-89; Docent in Mathematics, Clark University, 1889-92; Assistant Professor, 1892-1903. Member of the London Mathematical Society; Resident Fellow of the American Academy of Arts and Sciences.

CARROLL D. WRIGHT, PH. D., LL. D. 96 Woodland St.
Professor of Statistics and Social Economics

President, Clark College, 1902-.

CLIFTON F. HODGE, PH. D. 3 Charlotte St.
Professor of Biology

A. B., Ripon College, 1882; Fellow in Biology, Johns Hopkins University, 1888-89; Ph. D., Johns Hopkins University, 1889; Fellow in Psychology and Assistant in Neurology, Clark University, 1889-91; Instructor in Biology, University of Wisconsin, 1891-92; Assistant Professor of Physiology and Neurology, Clark University, 1891-1906; Professor of Biology, Clark College, 1902-.

WILLIAM H. BURNHAM, PH. D. 100 Chatham St.
Professor of Pedagogy

A. B., Harvard University, 1882; Instructor in Wittenberg College, 1882-83; Instructor, State Normal School, Potsdam, N. Y., 1883-85; Fellow Johns Hopkins University, 1885-86; Ph. D., 1888, and Instructor in Psychology, 1888-89; Docent in Pedagogy, Clark University, 1890-92; Instructor, 1892-1900; Assistant Professor, 1900-1906.

ALEXANDER F. CHAMBERLAIN, PH. D. 19 Baker St.
Assistant Professor of Anthropology

B. A. (1886), M. A. (1889), University of Toronto; Fellow in Modern Languages, University College, Toronto, 1887-90; Librarian, Canadian Institute, Toronto, 1889-90; Fellow in Anthropology, Clark University, 1890-92; Ph. D., Clark University, 1892; Lecturer in Anthropology, Clark University, 1892-1900; Acting Assistant Professor, 1900-04; Associate Editor, *American Antiquarian*; Editor, *Journal of American Folk-Lore*; Corresponding Member, O Instituto do Coimbra, Portugal; Member of the American Antiquarian Society.

JOSEPH DE PEROTT 5 Gates St.
Lecturer in Mathematics

Student, Universities of Paris and Berlin, 1877-80.

LOUIS N. WILSON, Litt. D. 11 Shirley St.
Librarian of the University and Custodian of the Art Collection

A. B., Clark University, 1905; Litt. D., Tufts College, 1905.

FREDERICK A. BUSHEE,* PH. D. 45 Hollywood St.
Instructor in Economics and Sociology

Litt. B., Dartmouth College, 1894; A. M., Harvard University, 1898; Ph. D., 1902; Resident South End House, Boston, 1894-95, 1896-97; Hartford School of Sociology, 1895-96; Harvard University, 1897-1900; Collège Libre des Sciences Sociales, Collège de France, Paris, University of Berlin, 1900-01; Assistant in Economics, Harvard University, 1901-02; Instructor in Economics and History, Clark College, 1902-03; Assistant Professor of Economics, *ibid.*, 1903-.

BENJAMIN S. MERIGOLD, PH. D. 59 Chatham St.
Instructor in Chemistry

A. B., Harvard University, 1896; A. M., 1897; Ph. D., 1901; Assistant in Chemistry, Harvard University, 1896-1900; Instructor in Chemistry, Worcester Polytechnic Institute, 1900-1903; Assistant Professor of Chemistry, Clark College, 1903-.

*On leave of absence, 1905-06.

GEORGE H. BLAKESLEE, PH. D.

940 Main St.

Instructor in History

A. B., Wesleyan University, 1893; A. M., Harvard University, 1899; Ph. D., 1903; Student, Johns Hopkins University, 1893-94; Parker Fellow, Harvard, 1901-02; Student, Universities of Berlin, Leipzig, and Oxford, 1901-03. Instructor in History, Clark College, 1903-04; Assistant Professor, *ibid.*; 1904- .

ANNUAL APPOINTMENTS

EDWARD COWLES, M. D., LL. D.

Boston, Mass.

Non-Resident Lecturer on Psychiatry

A. B., Dartmouth College, 1859; A. M., 1863; Medical House Pupil, Retreat for the Insane, Hartford, Conn., 1860-62; M. D., Dartmouth Medical School, 1863; M. D., College of Physicians and Surgeons, New York, 1863; Medical Corps, United States Army, 1863-72; Resident Physician and Superintendent, Boston City Hospital, 1872-79; Medical Superintendent, McLean Hospital, Waverley, Mass., 1879-1903; Lecturer on Mental Diseases, Dartmouth Medical School, 1885-86; Professor of Mental Diseases, *ibid.*, 1886- ; Fellow by Courtesy, Johns Hopkins University, 1887-88; Clinical Instructor in Mental Diseases, Harvard Medical School, 1888-; LL. D., Dartmouth College, 1890.

HONORARY FELLOWS

ALVIN BORGQUIST, PH. D.

Honorary Fellow in Psychology

64 Woodland St.

B. S., University of Utah, and Graduate, State Normal School, Utah, 1897; Graduate Student, Leland Stanford Jr. University, January 1898-May 1903; Graduate Student, University of California, 1903-04; Fellow in Psychology, Clark University, 1904-05; Research Assistant to Professor Sanford, 1905-06; Ph. D., Clark University, 1906.

FREDERICK J. B. CORDEIRO, M. D.

Honorary Fellow in Physics

21 Oberlin St.

A. B., Harvard University, 1881; M. D., 1884; Retired Surgeon, United States Navy; Student, University of Berlin, 1890-91; 1894-95.

U. WALDO CUTLER, B. S.

Honorary Fellow in Psychology

63 Lancaster St.

B. S., Worcester Polytechnic Institute, 1874; Student at Leipzig, Göttingen and Geneva Universities, 1879-1881; Instructor in Modern Languages, Worcester Polytechnic Institute, 1881-92; Professor, 1892-1903; Student at Johns Hopkins University, 1889; Honorary Fellow in Psychology, Clark University, 1905-06.

JEAN DAWSON, PH. D., Ann Arbor, Mich.

Honorary Fellow in Biology

46 Florence St.

Graduate State Normal College, Ypsilanti, Mich., 1896; A. B., University of Michigan, 1902; A. M., 1903; Ph. D., 1905; Assistant in Biology, *ibid.*, 1903-04; Honorary Fellow in Biology, Clark University, 1905-06.

BERTHA C. DOWNING, M. D., Lexington, Mass.

Honorary Fellow in Psychology

Harvard Annex, 1884; M. D., Woman's Medical College of Pennsylvania, 1896; Member of Clinical Staff, New England Hospital, Roxbury, 1900-03; Member of New England Hospital Medical Society; Fellow of the Alumnae Ass'n of the Woman's Medical College of Pennsylvania, and Honorary Fellow in Psychology and Biology, Clark University, 1905-06.

CHARLES WILSON EASLEY, A. M.

Honorary Fellow in Chemistry

87 Woodland St.

A. B., Dickinson College, 1897; A. M., 1899; Scholar in Physics, Clark University, 1901-02; Fellow, 1902-03; Honorary Fellow, 1903-04; Instructor in Chemistry, Clark College, 1902- .

GORDON SCOTT FULCHER, M. S., Evanston, Ill.

Research Assistant to Professor Webster

18 Gates St.

B. S., Northwestern University, 1905; M. S., 1906; Fellow in Physics, *ibid.*, 1905-06.

S. B. HASLETT, PH. D.

Honorary Fellow in Psychology

9 Randall St.

Graduate of the Edinboro (Pa.) State Normal School, 1883; A. B., Grove City College, Pa., 1889; A. M., 1896; Graduate, Allegheny Theological Seminary, 1892; Scholar in Psychology, Clark University, 1898-1900; Fellow, 1900-01; Ph. D., Clark University, 1901; Professor of Psychology and Education, Bible Normal College, Hartford, Conn., and Lecturer in Hartford Theological Seminary, 1901-02; Honorary Fellow in Psychology, Clark University, 1902-06.

FREDERICK H. HODGE, A. M.

Honorary Fellow in Mathematics

24 Hollywood St.

A. B., Boston University, 1894; A. M., 1899; Special Student, Mass. Normal School, Bridgewater, 1894-95; Professor of Mathematics, John B. Stetson University, 1895-96; Graduate Student in Mathematics, University of Chicago, 1896-97; Scholar in Mathematics, Clark University, 1897-98; Fellow, 1898-99, 1901-03; Honorary Fellow, 1903-06; Professor of Mathematics and History, Bethel College, 1899-1901; Instructor in Mathematics, Clark College, 1902-05; Assistant Professor, 1905- .

JOHN CHARLES HUBBARD, PH. D.

Honorary Fellow in Physics

8 Loudon St.

B. S., University of Colorado, 1901; Scholar in Physics, Clark University, and Assistant to Professor Webster, 1901-02; Fellow, 1902-04; Ph. D., Clark University, 1904; Instructor in Physics, Simmons College, 1904-05; Assistant Professor of Physics, New York University, 1905-06; Assistant Professor of Physics, Clark College, 1906- .

FRED KUHLMANN, PH. D., Grand Island, Neb.

Research Assistant to Professor Sanford

44 May St.

A. B., University of Nebraska, 1899; A. M., 1901; Scholar and Assistant in Psychology, *ibid.*, 1899-1900; Fellow and Assistant, 1900-01; Fellow in Psychology, Clark University, 1901-02; Fellow and Assistant, 1902-03; Ph. D., Clark University, 1903; Honorary Fellow and Assistant, 1903-05; Assistant in Psychology, University of Wisconsin, 1905-06.

THOMAS SCOTT LOWDEN, PH. D.

Honorary Fellow in Psychology

42 Richards St.

Student, Glasgow (Ky.) Normal School, 1887-89; Instructor in English, *ibid.*, 1888-89; A. B., Thiel College, 1893; A. M. and Ph. D., University of Wooster, 1895; Dean of Eastern Indiana Normal School and Professor of Philosophy and Education, 1899-1901; Professor of Pedagogy, De Pauw University, 1901-04; Fellow in Psychology, Clark University, 1904-06; Ph. D., Clark University, 1905.

CAREY EYSTER MELVILLE, B. A.
Honorary Fellow in Mathematics 101 May St.

B. A., Northwestern University, 1901; Fellow in Mathematics, *ibid.*, 1901-02; Graduate Student in Mathematics, Johns Hopkins University, 1902-03; Instructor in Mathematics, Case School of Applied Science 1903-06; Assistant in Mathematics, Clark College, 1906- .

JOSIAH MOSES, PH. D., Richmond, Va.
Honorary Fellow in Psychology 815 Main St.

A. B., Richmond College, 1899; A. M., 1900; Scholar in Psychology, Clark University, 1900-01; Fellow, 1901-04; Honorary Fellow and Assistant, 1904-05; Ph. D., Clark University, 1905; Instructor in Psychology and Education, University of Texas, 1905-06.

CAROLINE A. OSBORNE, M. D.
Honorary Fellow in Biology 87 Woodland St.

M. D., Woman's Medical College of Pennsylvania, 1899; Superintendent of Nurses, Memorial Hospital, Worcester, Mass., 1899-1904; Instructor of Nurses, *ibid.*, 1904- ; Student in Biology, Clark University, 1901-05; Fellow, 1905-06.

JAMES P. PORTER, PH. D.
Honorary Fellow in Psychology 938 Main St.

A. B., Indiana University, 1898; A. M., 1901; Student, Indiana State Normal School, 1890-91, 1892-93; Instructor in Psychology, Indiana University, 1900-03; In charge of Work in Neurology, Indiana University Biological Station, 1901 and 1903; Honorary Fellow in Psychology, Clark University, 1903-06; Ph. D., Clark University, 1906; Instructor in Psychology, Clark College, 1903- .

W. F. ROBIE, M. D., Baldwinville, Mass.
Honorary Fellow in Psychology and Biology

A. B., Dartmouth College, 1889; M. D., Dartmouth Medical School, 1893; Assistant Physician, Hospital Cottages, 1892-94; Supt. Riverview Sanitarium, 1902- ; Student in Psychology and Biology, Clark University, 1904-05; Honorary Fellow, 1905-06.

THEODATE L. SMITH, PH. D.
Research Assistant to President Hall 23 Maywood St.

A. B., Smith College, 1882; A. M., 1884; Yale University, 1893-95; Special Student Clark University, 1895-96; Ph. D., Yale University, 1896; Cornell University, 1900; Assistant to President Hall in research work under Carnegie Grant, Clark University, 1902-04; Estabrook Grant, October 1904-February 1905; Berlin University, April-August, 1905; Research Assistant to President Hall, Clark University, 1905-06.

MILLETT TAYLOR THOMPSON, PH. D.
Honorary Fellow in Morphology 23 Maywood St.

A. B., Brown University, 1898; Ph. D., 1902; Fellow in Biology, Clark University, 1902-03; Honorary Fellow, 1903-06; Instructor in Zoölogy, Clark College, 1902-06; Assistant Professor 1906- .

FELLOWS AND SCHOLARS

LEWIS FLINT ANDERSON, M. A., Marquette, Mich.
Fellow in Pedagogy 10 Montague St.

B. A., University of Toronto, 1893; M. A., 1902; Student, University of Leipzig, 1897-99; Instructor in Psychology and Education, State Normal School, Marquette, Mich., 1899- .

- NORMAN HERBERT ANNING, M. A., Oxmead, Canada.**
Fellow in Mathematics 8 Loudon St.
B. A., Queen's University, Kingston, Canada, 1905; M. A., 1906; Tutor in Physics, *ibid.*, 1903-04; Tutor in Mathematics, 1904-05.
- HORACE L. BRITTAIN, M. A., Woodstock, N. B.**
Fellow in Psychology 101 May St.
B. A., University of New Brunswick, 1895; M. A., 1898; Scholar in Psychology, Clark University, 1904-05.
- ERNEST WILLIAM COFFIN, B. A., Charlottetown, P. E. I.**
Fellow in Psychology 78 Florence St.
B. A., Dalhousie University, 1902; Fellow in Psychology, Clark University, 1905-06.
- WILLIAM F. COPELAND, PH. M., Uhrichsville, Ohio.**
Fellow in Biology 1 Kilby St.
Ph. B., Ohio University, 1902; Ph. M., 1903; Assistant in Biology and Geology, *ibid.*, 1902-05; Fellow in Biology, Clark University, 1905-06.
- ORIS P. DELLINGER, A. B., Bicknell, Ind.**
Fellow in Biology 3 Charlotte St.
Graduate, Indiana State Normal School, 1900; Student, University of Chicago, 1900-01; Assistant in Biology, Indiana State Normal School, 1901-03; A. B., Indiana University, 1904; Fellow in Biology, Clark University, 1904-06; Assistant in Biology, Clark College, 1904- .
- CHARLES E. DISNEY, A. B.**
Fellow in Biology 31 Edwards St.
A. B., Clark College, 1905; Scholar in Biology, Clark University, 1905-06; Assistant in Biology, Clark College, 1905-06.
- ARTHUR H. ESTABROOK, A. M., Leicester, Mass.**
Fellow in Biology
A. B., Clark College, 1905; A. M., Clark University, 1906; Scholar in Biology, *ibid.*, 1905-06; Assistant in Biology, Clark College, 1906- .
- WILLIS L. GARD, A. B., Elkhart, Ind.**
Fellow in Psychology 3 Charlotte St.
A. B., Indiana University, 1896.
- BURTON N. GATES, A. M.**
Fellow in Biology 10 Charlotte St.
A. B., Clark College, 1905; A. M., Clark University, 1906; Scholar in Biology, *ibid.*, 1905-06; Assistant in Biology, Clark College, 1906- .
- ELMER A. HARRINGTON, A. M., Winchendon, Mass.**
Fellow in Physics 44 May St.
A. B., Clark College, 1905; A. M., Clark University, 1906; Scholar in Physics, *ibid.*, 1905-06; Assistant in Chemistry, Clark College, 1905-06; Assistant in Physics, 1906- .
- JAMES WILLIAM HARRIS, A. B., Lexington, Ky.**
Fellow in Psychology 78 Florence St.
A. B., Union College, Barbourville, Ky., 1901; Scholar in Psychology, Clark University, 1905-06.

- EUCLID HÉLIE, A. B.,** Grande Ligne, Quebec.
Fellow in Psychology 101 May St.
A. B., McMaster University, Toronto, Canada, 1905; Scholar in Psychology, Clark University, 1905-06.
- DAVID SPENCE HILL, A. B.,** St. Louis, Mo.
Fellow in Philosophy 46 Florence St.
A. B., Randolph-Macon College, 1897; Student, Washington University Law School, 1901-02; Fellow in Psychology, Clark University, 1905-06.
- HIKOZO KAKISE,** Oitaken, Japan.
Fellow in Psychology 76 Woodland St.
Graduate, Tokio Imperial University, 1901; Assistant in Psychology, *ibid.*, 1902-06.
- OLAF K. LIE,** Kongsberg, Norway.
Fellow in Mathematics 522 Pleasant St.
Graduate, Cadet-School, Kristiania, 1884; Fellow in Mathematics, Clark University, 1905-06.
- NEWTON MILLER, M. A.,** Thorntown, Ind.
Fellow in Biology 78 Florence St.
A. B., Indiana University, 1905; A. M., 1906.
- TADASU MISAWA,** Takanabe, Japan.
Fellow in Psychology 46 Woodland St.
Graduate, Tokio Imperial University, 1904; Fellow in Psychology, Clark University, 1905-06.
- GEORGE ORDAHL, A. M.,** Eugene, Ore.
Fellow in Pedagogy 6 Hancock St.
B. S., Valparaiso College, 1899; A. B., University of Oregon, 1905; A. M., 1906.
- JOSEPH ADAMS PUFFER, B. A.,** Gardner, Mass.
Fellow in Pedagogy
B. A., Wesleyan University, 1896; S. T. B., Boston University, 1900; Scholar in Pedagogy, Clark University, 1905-06.
- HERMON L. SLOBIN, A. B.**
Fellow in Mathematics 3 Blake St.
A. B., Clark College, 1905; Scholar in Mathematics, Clark University, 1905-06.
- GEORGE E. STEBBINS, A. B.,** Shelburne Falls, Mass.
Fellow in Physics 17 Oread Place.
A. B., Bates College, 1903; Assistant in Physics, *ibid.*, 1903-04; Scholar in Physics, Clark University, 1904-05; Fellow, 1905-06.
- WILLIAM E. STORY, JR., A. B.**
Fellow in Physics 17 Hammond St.
A. B. Harvard University, 1904; Scholar in Physics, Clark University, 1904-05; Fellow, 1905-06.
- JESSE HAYES WHITE, A. M.,** Alamo, Ind.
Fellow in Psychology 18 Gates St.
A. B., Indiana University, 1903; A. M., 1904; Assistant in Experimental Psychology, *ibid.*, 1903-04.

CHARLES W. BACON, A. B., North Oxford, Mass.

Scholar in Chemistry

A. B., Clark College, 1906.

FRANCIS M. BALDWIN, A. B., West Upton, Mass.

Scholar in Biology

2 Grand St.

A. B., Clark College, 1906.

ROBERT IRVING BRAMHALL, A. M.

Scholar in History

10 Dewey St.

A. B., Clark College, 1905; A. M., Clark University, 1906; Scholar in History, *ibid.*, 1905-06; Assistant in History, Clark College, 1905-

JOHANNES BROENE, Pd. B., Grand Rapids, Mich.

Scholar in Psychology

78 Florence St.

Pd. B., Valparaiso University, 1906.

HERBERT BURNHAM DAVIS, A. B.

Scholar in Psychology

54 Florence St.

A. B., Bates College, 1890.

EDITH MONTGOMERY DIXON, A. B.

Scholar in Biology

11 Walnut St.

A. B., Vassar College, 1906.

LOUISE ELLISON, A. B., St. Louis, Mo.

Scholar in Psychology

2 Woodbine St.

A. B., Washington University, 1906.

ROBERT JOHN FLOODY, S. T. B.

Honorary Scholar in Psychology

43 Endicott St.

Graduate, Teachers Training School, Ont., Can., 1882; B. S., Albion College, 1890; M. S., 1894; S. T. B., Boston University, 1894; Student in Philosophy, Clark University, 1904-06.

ARTHUR OLIN GRIGGS, Ph. B., Westford, Conn.

Scholar in Pedagogy

6 Hudson St.

Ph. B., Wesleyan University, 1898; Professor of Mathematics, Virginia Union University, 1902-04.

WILLIAM HAROLD KEITH, A. M.

Scholar in History

24 Beaver St.

A. B., Clark College, 1905; A. M., Clark University, 1906; Scholar in History, *ibid.*, 1905-06.

C. ALLAN LYFORD, A. M.

Honorary Scholar in Chemistry

32 Clifton St.

B. S., Worcester Polytechnic Institute, 1903; Fellow in Biology, Clark University, 1903-05; Assistant in Biology and Chemistry, Clark College, 1904-05; Assistant in Chemistry, 1905-; Scholar in Chemistry, 1905-06; A. M., Clark University, 1906.

MAURICE WALTER MEYERHARDT

Scholar in Psychology

5 Clayton St.

Student at Koellnisches Gymnasium, Berlin, seven years; Special Student in Psychology, Clark University, 1903-04; Scholar, 1904-06.

- ALLAN BALCOM MILLER, A. B.**
 Scholar in Biology 32 Westland St.
 A. B., Clark College, 1905; Student in Biology, Clark University, 1905-06.
- CARLETON B. NICKERSON, A. B.,** Boothbay Harbor, Me.
 Scholar in Chemistry Spencer, Mass.
 A. B., Clark College, 1906.
- TIMOTHY J. STEVENSON, A. B.**
 Scholar in Psychology 6 Gladstone St.
 A. B., Clark College, 1906.
- JUN WATANABE, Tokio, Japan.**
 Scholar in Economics 46 May St.
 Graduate, Keiogizuku (College) University, 1905.

SPECIAL STUDENTS

- JOHN MERRICK BEMIS, M. D.**
 Student in Psychiatry 223 Salisbury St.
 M. D., University of Vermont, 1893.
- SUZANNE BRETT, Buffalo, N. Y.**
 Student in Economics and Sociology 66 Pleasant St.
- CARL J. HARRIS, PH. C.**
 Student in Chemistry 29 King St.
 Ph. C., Massachusetts College of Pharmacy, 1905.
- MCLEOD HARVEY, A. B.**
 Student in Philosophy 5 Oread Place
 A. B., Dalhousie College, Halifax, Nova Scotia, 1889; Graduate in Theology, Presbyterian College, Halifax, 1891; Student in Philosophy, Clark University, 1902-06.
- MAY SALONA HOLMES, M. D.**
 Student in Psychology Isolation Hospital
 M. D., Woman's Medical College of New York Infirmary, 1895; House Officer, Memorial Hospital, Worcester, 1895-96; Superintendent and Resident Physician, Isolation Hospital, 1896- ; Student in Psychology and Biology, Clark University, 1905-06.
- EDWARD B. SAUNDERS, A. B.,** Fitchburg, Mass.
 Student in Psychology.
 B. D., St. Lawrence University, 1900; A. B., 1904.
- WILLIAM G. SIDDELL, A. B.,** Westboro, Mass.
 Student in Psychology
 A. B., Syracuse University, 1902.
- H. LOUIS STICK, M. D.**
 Student in Psychology Worcester Insane Asylum
 M. D., College of Physicians and Surgeons, Baltimore, 1900; Resident Physician, Baltimore City Hospital, June 1900-November 1901; Interne, Criminal Insane Asylum, Bridgewater, November 1901-February 1903; Assistant Resident Physician, Worcester Insane Asylum, February 1903- .

INMAN L. WILLCOX, A. M.

Student in Philosophy

138 Elm St.

A. B., Hamilton College, 1886; A. M., Harvard University, 1900; Student, Andover Theological Seminary, 1886-1889; Scholar in Psychology, Clark University, 1901-02; Student, 1902-06.

ATTENDANTS UPON SATURDAY COURSES

| | |
|--------------------|-----------|
| O. H. ADAMS | Leicester |
| ANNA L. CALLAHAN | Worcester |
| MARY J. CALLAHAN | Worcester |
| MRS. H. B. DAVIS | Worcester |
| MRS. MARY A. DAVIS | Worcester |
| SARAH L. GOULD | Worcester |
| FLORENCE E. KEITH | Worcester |
| MARIETTA KNIGHT | Worcester |
| EMMA A. LEGG | Worcester |
| RAYMOND McFARLAND | Leicester |
| O. A. MORTON | Marlboro |
| ELIZABETH O'MALLEY | Worcester |
| LUCY A. OSBORNE | Worcester |
| ETTA SINSABOUGH | Leicester |
| KATE E. SMITH | Worcester |
| LUCY H. OLMSTED | Worcester |

FLORENCE CHANDLER

Clerk of the University

52 Woodland St.

ADMINISTRATION

The trustees are the ultimate source of authority in all matters pertaining to the University. They act collectively through the committees named below, and also through the president of the University.

DUTIES OF THE PRESIDENT OF THE UNIVERSITY

The duties of this office were defined by the Trustees, May 23, 1889, as follows:

The President of the University shall consult frequently with the Trustees on all matters which concern the welfare of the University, and attend the meetings of the Board. He shall confer with each instructor concerning the development of his department, determine the duties and authority of each, and preside at the meetings of the Faculty. He shall be the authorized medium of communication between the Board of Trustees and the officers of instruction, individually and collectively, in all matters involving the administration of the University. The enactments of the Board concerning instructors and their work, and all requests, complaints and proposals from the Faculty to the Trustees shall be made known through him. He shall exercise or provide such superintendence over buildings, apparatus, books and other property, as will secure

their protection and appropriate use. Expenditures must not be ordered by any instructor of the University without his previous consent or the express authority of the Board.

These duties were more fully defined by By-Laws enacted by the Corporation Sept. 26, 1889. These are as follows :

BY-LAWS

1. The President of the University shall preside on all public academic occasions, shall direct the official correspondence, study the wants and interests of the whole University and exercise a general superintendence over all its concerns. His first care, and that of the authorities of the University, shall be the departments already established, and next those closely related to them; but no other department shall be established until those already introduced have been brought to the highest state of efficiency then possible. All acts, however, which shall involve the expenditure of money in the administration of the University's affairs, shall be subject to the approval of the Board of Trustees or the Finance Committee for the time being.

2. As the efficiency of a University depends chiefly upon the quality of its Faculty, the Board of Trustees will hold the President to a strict but reasonable accountability for the fidelity and ability of each instructor. The President only shall have the power to select and appoint all officers of instruction, subject to the approval of the Board of Trustees. To make wise and well considered appointments, to maintain harmony within the Faculty and to increase their efficiency in research

and instruction shall be his most important duty. If at any time the President shall be negligent in the discharge of these or other duties, or is from any cause disabled from discharging them, they may be exercised by the Board of Trustees.

3. The President of the University shall be the medium of communication between the Trustees and Instructors, individually and collectively, upon all matters within the field of action of either body. He shall attend all meetings of the Board of Trustees, of which he shall be notified, and shall participate in their deliberations, but without the power to vote. All complaints and requests from members of one body to the other shall be made through him.

4. The President shall call and preside over all official meetings of the Instructors, and a record of their proceedings shall be kept. These records are in no case to be made known to others than the Trustees. They shall always be in the custody of the President, but may be inspected by the Trustees, or either of them at any time.

5. The President of the University, in the absence of the Trustees or Finance Committee, shall have the entire direction and control of the persons employed about the University and not engaged in the work of instruction; the duties of all such persons shall be assigned and they shall be appointed or removed by him, subject to the approval of the Finance Committee.

6. No instructor shall order any books or apparatus, or anything connected with the work of instruction (beyond his appropriation), without the approval of the President. No expense for the care of buildings or grounds, nor for alterations or repairs within and upon

the same shall be made without the approval of the Board of Trustees or the Finance Committee, such alterations or repairs in no case to exceed the appropriations made for that purpose. If the Trustees, or Finance Committee, or any person shall make contracts in behalf of the University without authority, the officer or person making such contract shall become individually responsible therefor.

7. The officers of instruction shall be appointed for a term of from one to five years. At the end of this period the work of each instructor will be subjected to a careful scrutiny upon the results of which his reappointment shall depend, always provided, however, that any Instructor will be liable to be discharged at any time for incapacity, neglect of duty, or for such other cause as shall seem good to the Trustees.

8. Each Instructor shall give stated lectures to however few. He shall actively and zealously strive to maintain the highest possible standard, shall work in a spirit of hearty sympathy and co-operation, and shall encourage research by precept and, if possible, by example.

9. The foregoing By-Laws are intended to embody the provisions contained in a vote passed by the corporation on the twenty-third day of May, A. D. 1889, upon the motion of Judge Devens. (See above.) If at any time hereafter any discrepancy shall be found to exist between the two, said By-Laws shall be so far modified as to conform to the provisions of said vote.

10. No instructor shall engage in any outside professional or technical pursuit without the approval of the Board, the Finance Committee, or the President.

11. These By-Laws, or any one of them, may be changed, amended, or repealed by a vote of three-fourths at least of the Trustees at any meeting of their Board duly called, notified, and held for that purpose.

GENERAL STATEMENTS

The University now consists of a group of nine departments, in which all its work and that of Instructors, Fellows and Scholars is grouped.

These departments are as follows:

- I. MATHEMATICS
- II. PHYSICS
- III. CHEMISTRY
- IV. BIOLOGY
- V. ANTHROPOLOGY
- VI. PSYCHOLOGY
- VII. PEDAGOGY
- VIII. ECONOMICS AND SOCIOLOGY
- IX. HISTORY

THE FACULTY

The Faculty elect Fellows and take action upon general requirements for the Doctor's and Master's degrees and other promotions, act and advise upon whatever may be officially submitted to them by the Board or by the President, and consider all matters not otherwise provided for and in which all departments of the University are alike interested.

ADMISSION

Only graduate students or those of equivalent attainments are admitted to full membership in the University, except in rare and special cases.

At present no entrance examinations are required; but by testimonials, diplomas, personal interviews, or written specimens of work, the authorities must be satisfied that the applicants have scholarship enough to work to advantage, and zeal and ability enough to devote themselves to their chosen field. The methods of the University are too costly, and its energy and funds too precious, to be spent upon those who are not well trained, promising, and in earnest.

It is highly desirable that candidates entering any of the nine departments, shall have, besides a knowledge of the other subjects commonly taught in colleges, a reading knowledge of French and German.

For the select students who are received, it is the purpose of the University to open all its privileges and to supply every incentive possible in the way of books, facilities, and, above all, direct personal stimulus. The chief as well as the best work of this University is individual, and involves daily suggestion, encouragement and direction. The limited number of students per-

mits more or less personal instruction in each case.

CLASSES OF APPOINTEES

No clearly marked line exists between students and instructors. Fellows who have attained some degree of mastery in a special line of work sometimes give brief special courses, which may be attended by professors. This is a stimulus to the student, and both tests and exhibits power in teaching.

I. DOCENTS

The highest annual appointment not involving membership in its Faculty is that of Docent. These positions are primarily honors, and are reserved for the few whose work has already marked a distinct advance beyond the Doctorate and who wish to engage in research. Docents are not assistants, and their relations are directly with the President of the University.

Docents may be provided with individual rooms, and special apparatus may be purchased for their work if desired and approved. While they will be expected to deliver a limited number of lectures on some special chapter of their department, their time will be mainly reserved for study and research in a way best adapted to qual-

ify them still more fully for academic advancement.

These positions are official appointments made by the Faculty upon nomination of the head of the department and on the following conditions:

1. The candidate must have received the degree of Ph. D. at least one year before he can enter upon the duties of Docentship.

2. That year must have been spent in research and the candidate must have given evidence of his skill and capacity as a teacher by giving a course of lectures, by assisting in the regular work of instruction in this or some other institution of university rank, or in some other satisfactory manner.

3. The candidate must prepare and read in public an habilitation address approved as such by the chief instructor in his department.

4. If these conditions are fulfilled he will receive at the close of his address a diploma granting him the *venia docendi* for the following year in this University and formally attesting his fitness as both scholar and teacher for an academic chair.

5. The fee for this diploma shall be \$25, which in case of need the Faculty shall have power to remit.

A memoir or essay representing original work

in the department, but no examination, is required. This highest formal academic honor will be strictly reserved for those of marked scientific attainment and teaching ability and, so far as this diploma can have the significance of a title or degree, it will be regarded by the University as a brevet collegiate professorship.

It is believed that the difficulties under which college trustees sometimes succumb in selecting suitable professors may be diminished by the existence of such a select body of scholars of guaranteed scientific training, ability and approved power to teach, and that otherwise this new grade will aid in raising the standing of academic scholarship in colleges and in encouraging scientific research here. Appointees of this class may be paid a small salary.

II. LECTURES

Those who have already taken the degree of Doctor of Philosophy or who are under appointment as Fellows may, on recommendation of the head of the department, be designated to give a number of lectures upon topics in which they have attained special competency.

III. DOCTORS OF PHILOSOPHY

Those who have already advanced to the Doc-

tor's degree may be appointed Honorary Fellows and given the privileges of the University, including those of the Library. In past years many who have already taken this degree, either in this country or abroad, and who are awaiting academic appointment, have found these positions both helpful for their own further research and development and also advantageous for obtaining the collegiate and university appointments that they seek.

IV. CANDIDATES FOR THE DEGREE OF DOCTOR OF PHILOSOPHY

Candidates for the Doctor's degree must have previously taken the Degree of Bachelor of Arts or have had a substantial equivalent for the training implied by that degree.

At least one, but in most cases three, years of graduate work are necessary for this degree. Examinations for it, however, may be taken at any time during the academic year when, in the judgment of the University authorities, the candidate is prepared, provided the requirement of one year's residence has been absolved.

For this degree one requirement is a dissertation upon an approved subject, to which it must be an original contribution of value. To this capital importance is attached. It must be re-

ported on in writing by the chief instructor before the examination, printed at the expense of the candidate, and at least one hundred copies given to the University. However, in case of a dissertation of unusual length, or containing expensive plates, the Faculty shall have power, at the request of the candidate, to reduce this number of presentation copies to fifty.

Such formal or informal tests as the Faculty may determine shall mark the acceptance of each student or Fellow as a candidate for this degree. One object of this preliminary test shall be to insure a good reading knowledge of French and German. Such formal candidature shall precede the examination itself by a period prescribed in the special rules below.

The fee for the Doctor's degree is \$25, payable before the examination. The presentation copies of the dissertation must be in the hands of the Librarian before the diploma is delivered. In exceptional cases, and by special action of the Faculty, the act of promotion may precede the presentation of the printed copies of the dissertation.

An oral, but no written, examination is required upon at least one minor subject in addition to the major before an examination jury composed of at least four members, including

the head of the department and the President of the University, who is authorized to invite any person from within or without the University to be present and to ask questions. The jury shall report the results of the examination to the Faculty, who will recommend satisfactory candidates for the degree.

For the bestowal of this degree, the approbation of the Board of Trustees must in each case be obtained by their signature upon the diploma. They desire that the standard of requirements for it be kept the highest practicable, that it be reserved for those of superior ability and attainment only, and that its value be never suffered to depreciate.

It is to the needs of candidates for this degree that the lectures, seminars, laboratories, collections of books, apparatus, etc., are especially shaped, and no pains will be spared to afford them every needed stimulus and opportunity. It is for them that the Fellowships and Scholarships are primarily intended, although any of these honors may be awarded to others.

On November 14th, 1900, the following vote was passed by the Board of Trustees:

That the University will admit candidates for the degree of Doctor of Philosophy and will confer that degree without regard to sex.

SPECIAL RULES CONCERNING THE DOCTOR'S DEGREE

I. *Residence.* No candidate shall receive the degree of Doctor of Philosophy without at least one academic year's previous residence.

II. *Candidature for the Doctor's Degree.* Every applicant for the Doctor's degree shall fill out, before October fifteenth, the regular application blank provided at the office. This schedule shall be submitted to the head of the department and the instructor in the major subject. Before affixing their signatures they shall satisfy themselves, in such manner as they may desire, as to the fitness of the applicant.

III. When countersigned, this schedule shall be filed with the President, and the applicant will be examined in French and German by the annual Committee for that purpose.

IV. In case of a favorable report by this committee, the applicant shall be a regular candidate for the degree.

V. Candidates complying with all preliminary conditions, including the examinations in French and German, before November first will be allowed to proceed to the doctor's examination at any time between May fifteenth following and the end of the academic year.

VI. *The Doctor's Dissertation.* The disser-

tation must be presented to the instructor under whose direction it is written, and reported upon by him before the doctor's examination. In every case the dissertation shall be laid before the jury of examination, at the time of examination, in form suitable for publication. This provision shall not, however, preclude the making of such minor changes later as the chief instructor may approve.

VII. The dissertation shall be printed at the expense of the candidate and the required copies deposited with the Librarian within one calendar year after the first of October following the examination. The candidate alone will be held responsible for the fulfilment of these conditions.

VIII. The favorable report of the chief instructor, filed in writing with the Clerk of the University, shall be a sufficient imprimatur or authorization for printing as a dissertation. The printed copies shall bear upon the cover and title page the statement of approval in the following words, over the signature of the chief instructor :

A Dissertation submitted to the Faculty of Clark University, Worcester, Mass., in partial fulfilment of the requirements for the degree of Doctor of Philosophy, and accepted on the recommendation of

(NAME OF CHIEF INSTRUCTOR.)

IX. *Examinations for the Doctor's Degree.*
The examinations for the doctor's degree may

be held at any time during the academic year, provided that at least one academic year has elapsed since the completion of the preliminaries of candidature, except in the case of fulfilment of these conditions between the beginning of any academic year and November first of that year, to which case Rule V applies. The examinations shall be held at such hours and places as the President may appoint.

X. Examinations may also be held during the regular vacations of the University, but for these an additional fee of five dollars to each examiner and the reasonable travelling expenses of any examiners who are out of town, all payable in advance, will be required.

V. DEGREE OF MASTER OF ARTS.

This degree is conferred upon candidates who comply with the following requirements :

1. The candidate shall have previously taken the degree of Bachelor of Arts, or have had a substantial equivalent for the training implied by that degree, to be determined by special vote of the Faculty; but such degree or training must involve a good preparation for the work proposed for the Master's degree, in order that it may be accepted.

2. The candidate must devote a full academic

year to post-graduate work in this University after receiving the Bachelor's degree or the training accepted as its equivalent. This work shall be mainly in one department, but the candidate may do also such other work as shall be advised by the head of his principal department,—whose approval of the whole course shall be necessary. In particular cases, the candidate may be allowed, by special vote of the Faculty, to divide his work between two years; but the aggregate must, in all cases, amount to a full year's work, at least.

3. The candidate must satisfy the representatives of his principal department that he has done his work faithfully, and has mastered the subjects involved, by such written and oral examinations and other tests as the department may require. The head of the department shall make a written report to the Faculty of the grounds on which the candidate is recommended, specifying the amount and character of his work; and this report shall be filed in the office.

4. The candidate must present a thesis or written report on some topic included in his course or closely related to it, that shall receive the approval of the representatives of his principal department, be accepted by the Faculty, and filed in the office.

5. Every candidate recommended for the Master's degree shall pay a fee of ten dollars.

6. The Master's degree will be conferred at the annual commencement in June of any year on those candidates only who shall have made written application to be considered as such on or before January 15th preceding and shall have fulfilled all the conditions here specified at least one week before Commencement, at which time the academic year shall be regarded as ending for the purposes of section 2.

VI. SPECIAL STUDENTS NOT CANDIDATES FOR A DEGREE

Any one desiring to undertake a special and approved line of research, and whose attainments are such as to satisfy the requirements of the University, may also be received. This class includes persons who may desire to devote themselves exclusively to one or more of the special branches—mathematics, physics, chemistry, biology, anthropology, psychology, pedagogy, economics and sociology, or history,—but who do not care to matriculate or become candidates for a degree.

These students, provided they satisfy the heads of the departments of their training and competency in one subject, in which they must be advanced (although they may be less so, or even beginners, in other subjects), may be allowed en-

tire freedom in their choice and combination of studies, and as special students may enjoy all the privileges of the University.

These students may, with the approval of the President, be received for less than an entire year.

VII. PRELIMINARY CANDIDATES

Non-university students of less special or less advanced standing than the above classes, who contemplate becoming candidates for some higher degree, may also be received.

Students of this class must satisfy the authorities of the University of their attainments and that they contemplate advancing to a degree higher than that of A. B. The privileges and status of these students will be more fully defined later. They may, in exceptional cases, be elected to Scholarships.

FELLOWSHIPS AND SCHOLARSHIPS

From the George F. Hoar Fund of \$100,000 provided by the generosity of Andrew Carnegie, the sum of \$3,000 is now available for Junior and Senior Fellowships in the University. While the sums attached to these appointments are not fixed, a Senior Fellow may receive \$200 together with the remission of fees, which makes the value of the appointment \$300. A Junior Fel-

low may receive \$100 with remission of fees, which makes the value of the appointment \$200. Besides these, other appointments of Senior and Junior University Scholarships, with remission of fees, are made.

A CITIZEN'S FUND.

A citizen of Worcester has given a fund of \$5,000, the income of which is to be used for the aid of "some one or more worthy native born citizens of the city of Worcester who may desire to avail themselves of the advantages of the institution."

THE FIELD FUND

Mrs. Eliza W. Field has also given \$500, to be called the "John White Field Fund," the income of which is "to provide for the minor needs of a Scholar or Fellow."

The following regulations apply to the award of the income of the Field Fund:

1. Regard is had to the intellectual ability of the candidate as well as to need of pecuniary assistance.

2. Only candidates who have spent three months at the University are considered.

3. The head of each department will consider and report to the Faculty desirable cases in his department.

4. Applications are received not later than December 15th, and the awards made as soon as possible after the Christmas recess.

PURPOSE AND CONDITIONS OF FELLOWSHIPS AND SCHOLARSHIPS

Fellowships at Clark University are intended for young men and women of promise who desire to pursue post-graduate studies in order to fit themselves for intellectual careers. It is desirable, but not required, that candidates for these positions should intend to proceed to the degree of Doctor of Philosophy or to equivalent attainments. In general, those intending to devote themselves to some special branch of learning are preferred to those directly fitting themselves for one of the three learned professions, although the latter are not excluded.

No application blanks are provided, but it is desired that the candidate should state fully and in writing his course of study and submit testimonials or diplomas, especially such as indicate a decided preference for some particular department. These should also, if practicable, be accompanied by some specimen of the candidate's work. Applications will be considered in May and in October and should be in the hands of the President on or before the first day of either

month. In special cases vacancies may be filled by appointments at any time during the year. The names of unsuccessful candidates will not be made public.

Fellows must reside in Worcester during the entire academic year, devote themselves to special studies under the direction of their instructors, and give such evidence of progress or proficiency before the end of the year as the authorities shall require. It is generally expected that they will undertake some work of research during the year. They must co-operate in promoting harmony, order, and all the ends of the University, must not teach elsewhere, and may be reappointed at the end of the year. Being intended primarily as honors, both Fellowships and Scholarships are awarded without reference to pecuniary needs, so that those able and desiring to do so may relinquish the emolument and retain the title of "Scholar" or "Fellow."

The paying fellowships will, for the present, be restricted to the departments of mathematics, physics, biology, psychology, pedagogy, and economics.

METHODS

Besides field work, excursions to institutions (public and private), coaching and cram classes, clubs, examinations and other modes by which

knowledge now seems best imparted and retained, the following educational methods are prominent:

LECTURES. The Trustees desire that each instructor, of however few students, should prepare and deliver regular lecture courses, with diagrams, illustrative apparatus, and reference to standard text-books and the best current literature upon each topic. Advanced students are also encouraged to supplement the work of the professors by giving occasional special lectures and courses. Public lectures will be given from time to time.

SEMINARIES AND CONFERENCES. These are stated meetings for joint systematic work, under the personal direction of the professor, in some special part of his subject. Here students preparing theses and other papers for publication in the journals edited at the University read them in incomplete form for mutual criticism and help. Here, also, the results of individual reading are reported for the benefit of all; views are freely criticised; new inquiries, methods, comparisons, standpoints, etc., suggested. From the mutual stimulus thus given many important works have proceeded and the efficiency of universities has been greatly increased.

LABORATORY WORK. For beginners this has

been from the first the best of all forms of apprenticeship, bringing student and professor to a closer and mutually stimulating relation. Here the manipulation of apparatus is learned, processes are criticised, results obtained by other investigators are tested, and methods discussed and perfected, with a view to developing that independence in research which is the consummation of scientific culture.

NOTICES

The charge for tuition, giving all the privileges of the University, but not covering the laboratory fees, is \$100 per annum.

Board and lodging can be obtained near the University at very moderate rates.

Intending students will be given information, so far as possible, upon any of these or other points, in advance of official announcement, upon addressing the Clerk of the University, Miss Florence Chandler, Worcester, Mass.

All members of the University are expected to be present at the opening of each term and to continue in attendance to its close.

The following are the statements and announcements of the departments for the academic year, 1907-1908.

I

MATHEMATICS

PROGRAMME FOR 1907-1908

INSTRUCTION IN MATHEMATICS

The chief aim of the department is to make independent investigators of such students as have mathematical taste and ability; these naturally look forward to careers as teachers of the higher mathematics in colleges and universities, and we believe that the course of training best adapted to the development of investigators is also that which is most suitable for all who would be efficient college professors, even if they are not ambitious to engage in research. The first essential of success in either of these lines is the habit of mathematical thought, and the direct object of our instruction is the acquisition of this habit by each of our students. With this end in view, we expect every student to make himself familiar with the general methods and most salient results of a large number of different branches of mathematics, conversant with the detailed results and the literature of a few branches, and thorough master of at least one special topic to the extent of making a real contribution to our knowledge of that subject.

In accordance with these principles, the instruction is given by means of introductory, advanced, and special courses of lectures, seminars, and personal guidance in reading and investigation.

The introductory courses (mostly given in alternate years) treat the following subjects :

ANALYTIC GEOMETRY OF HIGHER PLANE CURVES, HIGHER SURFACES, AND TWISTED CURVES ; 5 hours a week, through the year.

DIFFERENTIAL EQUATIONS, AND CALCULUS OF VARIATIONS ; 5 hours a week, through the year.

THEORY OF FUNCTIONS OF REAL AND IMAGINARY VARIABLES, ELLIPTIC FUNCTIONS, AND DEFINITE INTEGRALS ; 5 hours a week, through the year.

THEORY OF NUMBERS ; 2 hours a week, one half-year.

MODERN SYNTHETIC GEOMETRY ; 2 hours a week, one half-year.

ALGEBRAIC SUBSTITUTIONS AND THEIR APPLICATION TO THE THEORY OF EQUATIONS ; 2 hours a week, one half-year.

ALGEBRAIC INVARIANTS ; 2 hours a week, one half-year.

FINITE DIFFERENCES ; 2 hours a week, one half-year.

It is expected that every student will take each course in the earliest year of his residence in which it is given, unless he has already completed an equivalent course elsewhere. The chief object of these courses is to make the student familiar with the various methods of mathematical research and the concepts of mathematical thought at the present day. Thus, for example, curves and surfaces are treated by modern methods from the beginning, with adequate consideration of the discoveries of the great geometers of recent times. The usual college courses in the theory of algebraic equations, analytic geometry, and the differential and integral calculus furnish all the necessary preparation for these introductory courses, although it is very desirable that the student be acquainted with the properties of determinants and their application to the solution of linear equations, and with the methods of solving differential equations of the simpler types. Deficiencies in these

subjects may be made up by attendance on the corresponding courses in the Collegiate Department of the University.

A Seminary will be conducted in connection with the introductory courses, in which the students will be exercised in individual investigation and the oral presentation of results. The literature of the topics discussed will here receive adequate attention.

Special advanced courses, open to such as have nearly or quite completed the introductory courses, are given annually in subjects varying with the interests of the instructors and the needs of the students.

Each advanced student is placed under the supervision of one of the instructors for guidance in the original investigation of some special topic; the successful issue of this investigation may furnish material for the dissertation required of a candidate for the degree of Doctor of Philosophy.

For the academic year 1907-1908, the following courses are offered

By PROFESSOR STORY

SEMINARY FOR ADVANCED STUDENTS; through the year.

Introductory courses :

ANALYTIC GEOMETRY OF HIGHER PLANE CURVES, HIGHER SURFACES, AND TWISTED CURVES; 5 hours a week, through the year.

ALGEBRAIC INVARIANTS; 2 hours a week, first half-year.

Advanced courses :

DIFFERENTIAL GEOMETRY; 2 hours a week, first half-year.

THEORY OF ERRORS; 2 hours a week, second half-year.

NON-EUCLIDEAN GEOMETRY; 2 hours a week, second half-year.

By PROFESSOR TABER

Introductory Course :

DIFFERENTIAL EQUATIONS, AND CALCULUS OF VARIATIONS;
5 hours a week, through the year.

Advanced Course :

TRANSFORMATION GROUPS ; 2 hours a week, through the year.
SEMINARY, through the year.

By PROFESSOR WEBSTER

[See announcement of Department of Physics, courses 7, 8, 9, 10.]

By M. DE PEROTT

Introductory Courses :

THEORY OF NUMBERS ; 2 hours a week, first half-year.

ALGEBRAIC SUBSTITUTIONS AND THEIR APPLICATION TO THE
THEORY OF EQUATIONS ; 2 hours a week, second half-year.

During the academic years 1889-1907, advanced and special courses have been given in :

1. THE HISTORY OF MATHEMATICS among various peoples from the earliest times to A. D. 1650.
2. THEORY OF NUMBERS.
3. LINEAR TRANSFORMATIONS AND ALGEBRAIC INVARIANTS, with applications to algebraic equations and geometry.
4. THEORY OF SUBSTITUTIONS, with application to algebraic equations.
5. PLANE ANALYTIC GEOMETRY.
6. SOLID ANALYTIC GEOMETRY.
7. HYPERSPACE AND NON-EUCLIDEAN GEOMETRY.
8. ENUMERATIVE GEOMETRY.
9. QUATERNIONS, with applications to geometry and mechanics.
10. MULTIPLE ALGEBRA, including matrices, quaternions, the "Ausdehnungslehre," and extensive algebra in general.
11. MODERN SYNTHETIC GEOMETRY.

12. THEORY OF FUNCTIONS according to Cauchy, Riemann, and Weierstrass, with applications.
13. WEIERSTRASS'S THEORY OF ELLIPTIC FUNCTIONS.
14. ABELIAN FUNCTIONS AND INTEGRALS.
15. NUMERICAL COMPUTATIONS.
16. THEORY OF QUADRATIC FORMS.
17. ANALYSIS SITUS, particularly the connectedness of surfaces and map-coloring.
18. SURFACES OF THE THIRD AND FOURTH ORDERS (analytically treated).
19. PLANE CURVES OF THE THIRD AND FOURTH ORDERS (analytically treated).
20. KLEIN'S ICOSAHEDRON-THEORY.
21. ELLIPTIC MODULAR FUNCTIONS.
22. THETA-FUNCTIONS OF THREE AND FOUR VARIABLES.
23. RIEMANN'S THEORY OF HYPERELLIPTIC INTEGRALS.
24. SYMBOLIC LOGIC.
25. TWISTED CURVES AND DEVELOPABLE SURFACES (torses).
26. RATIONAL AND UNIFORM TRANSFORMATIONS OF CURVES AND SURFACES.
27. THEORY OF FUNCTIONS OF A REAL VARIABLE.
28. DEFINITE INTEGRALS AND FOURIER'S SERIES.
29. ORDINARY DIFFERENTIAL EQUATIONS, including differential equations with infinitesimal transformations, general theory of linear differential equations, Gauss's, Legendre's and Bessel's functions.
30. PARTIAL DIFFERENTIAL EQUATIONS, including Laplace's, Bessel's, and Lamé's functions.
31. FINITE DIFFERENCES AND PROBABILITIES.
32. APPLICATIONS OF THE INFINITESIMAL CALCULUS TO THE THEORY OF SURFACES.
33. SIMULTANEOUS EQUATIONS, including Restricted Systems.
34. THEORY OF TRANSFORMATION GROUPS.
35. THE APPLICATION OF TRANSFORMATION GROUPS TO DIFFERENTIAL EQUATIONS.
36. THEORY OF ERRORS.

The advanced and special courses are not repeated at regular intervals, but properly prepared students will

receive the personal assistance of one or other of the instructors in reading any subject not announced for the year in which they desire to take it.

The number and scope of the advanced courses given each year have been, thus far, regulated by the number of students qualified to profit by them and by the individual interests of the instructors; these courses will be increased, both in number and variety, whenever a real demand for such an increase shall make itself apparent. While the present purely scientific character of the University precludes instruction in strictly technical branches, we hope that the time is not far distant when the demand shall make it advisable, and increased facilities shall make it possible, to announce courses in Descriptive Geometry, Graphical Statics, Mathematical Astronomy, Vital Probabilities, and all the more important applications of mathematics to other sciences and to technical subjects. The applications of mathematics to physics already receive adequate consideration, and the further extension of such applications awaits only a demand for it on the part of students.

Each year seminaries for the training of students in methods of investigation are conducted by the several instructors, and those who have attained the necessary proficiency are personally directed in individual researches, of which the results are published in various mathematical journals.

The degree of Doctor of Philosophy is conferred upon such students as have completed all the introductory courses and a satisfactory number of advanced and special courses, have presented approved memoirs embodying the results of original investigation, and have passed creditable examinations in their principal depart-

ment of study and in one subordinate department. Mathematical students are generally advised to offer theoretical physics as their subordinate subject, and facilities are given for acquiring the requisite knowledge of this subject during their first or second year at the University.¹ Three years of University work are ordinarily necessary to obtain the degree.

Every facility for the study of special branches will be given to properly prepared students who are not candidates for the doctor's degree, and to those who, having already taken the degree (here or elsewhere), wish to continue mathematical study or investigation.

MATERIAL FACILITIES

The library is provided with the more important textbooks, treatises, and memoirs on the various branches of mathematics, as well as the principal journals and transactions of learned societies that are devoted to any considerable extent to mathematics. Among the periodicals are the following:

Acta mathematica. Stockholm, Berlin and Paris, 1882 to date. Complete.

American association for the advancement of science. Proceedings, 1848 to date. Complete.

American journal of mathematics. Baltimore, 1878 to date. Complete.

American mathematical Society.

Bulletin. 1894 to date. Complete.

Transactions. 1900 to date. Complete.

Amsterdam. Koninklijke akademie van wetenschappen. *Verhandelingen*, 1854 to date. Complete.

Annali di matematica, pura ed applicata. Milano, 1889 to date.

¹ For requirements see p. 52.

Annals of mathematics. 1884 to date. Complete.

Archiv der mathematik und physik. 1901 to date.

Berlin. Königlich-preussische akademie der wissenschaften. Mathematische und naturwissenschaftliche mittheilungen aus den sitzungsberichten. 1882-97. Complete.

Berliner mathematische gesellschaft. Sitzungsberichten. 1902 to date. Complete.

Bibliotheca mathematica. Stockholm, Berlin and Paris, 1884 to date. Complete.

Bologna, Istituto di. Reale accademia delle scienze.

Commentarii. 1731-1791. Complete.

Novi commentarii. 1834-1849.

Memorie fis. e mat. 1806-1810.

Memorie. 1850 to date. Complete.

Boston. American academy of arts and sciences. Proceedings, 1878-95.

British association for the advancement of science. Report. 1831 to date. Complete.

Brussels. Académie royale des sciences des lettres et des beaux-arts de Belgique.

Bulletins. Ser. 3. 1889 to date.

Mémoires couronnés et mémoires des savants étrangers. 1889-90.

Bulletin des sciences, mathématiques et astronomiques. 1870 to date. Complete.

Cambridge philosophical society.

Proceedings. 1843 to date. Complete.

Transactions. 1822 to date. Complete.

Colorado, University of. Studies. 1902 to date. Complete.

Deutsche mathematiker vereinigung. Jahresbericht, Leipzig, 1890 to date. Complete.

Edinburgh philosophical journal. 1819-1826.

Fortschritte der mathematik, Jahrbuch über die. Berlin, 1868 to date. Complete.

France, Société mathématique de. Bulletin. Paris, 1873 to date. Complete.

Göttingen. Königliche gesellschaft der wissenschaften. Nachrichten von der k. gesellschaft der wissenschaften und der Georg-Augusts-universität. 1853 to date.

Haarlem. Hollandsche maatschappij der wetenschappen. Archives néerlandaises des sciences exactes et naturelles. 1866 to date. Complete.

International catalogue of scientific literature. 1902 to date. Complete.

Internationale mathematiker-kongress. Verhandlungen. 1897 to date. Complete.

Journal de mathématiques pures et appliquées. Paris, 1836 to date. Complete.

Journal für die reine und angewandte mathematik; gegründet von A. L. Crelle. Berlin, 1826 to date. Complete.

Leipzig. Königlich-sächsische gesellschaft der wissenschaften.

Berichte über die verhandlungen der mathematisch-physichen classe. 1849 to date. Complete.

Abhandlungen der mathematisch-physichen classe. 1852 to date. Complete.

Liège. Société royale des sciences. Mémoires. 1843 to date. Complete.

London mathematical society. Proceedings. 1865 to date. Complete.

London. Royal society.

Proceedings. 1800 to date. Complete.

Philosophical transactions. 1665 to date. Complete.

Mathematische annalen. Leipzig, 1869 to date. Complete.

Messenger of mathematics. Oxford, Cambridge and Dublin, 1862 to date. Complete.

Milan. Reale istituto lombardo di scienze e lettere.

Classe di scienze matematiche e naturali. Rendiconti. 1864-67. Complete.

Rendiconti. 1868 to date. Complete.

Memorie. 1843 to date. Complete.

New York mathematical society. Bulletin. 1891-94. Complete.

Nouvelles annales de mathématiques. Paris, 1842 to date. Complete.

Paris. Institut de France. Académie des sciences. Comptes rendus hebdomadaires des séances. 1835 to date. Complete.

Paris. Annales scientifiques de l'école normale supérieure. 1864 to date. Complete.

Paris. École polytechnique. Journal. 1794 to date. Complete.

Philosophical magazine. London, Edinburgh and Dublin, 1798 to date. Complete.

Quarterly journal of pure and applied mathematics. London, 1857 to date. Complete.

Revue semestrielle des publications mathématiques, rédigée sous les auspices de la société mathématique d'Amsterdam, 1893 to date. Complete.

Vienna. Kaiserliche akademie der wissenschaften. Sitzungsberichte der mathematisch-naturwissenschaftlichen classe. 1889 to date.

Zeitschrift für mathematik und physik. Leipzig, 1856 to date. Complete.

Zeitschrift für mathematische und naturwissenschaftliche unterricht. 1903 to date.

The University possesses a set of Brill's admirable models (wanting only those published during the last few years, which will be obtained as soon as possible) and Björlings thread models of developable surfaces.

The department possesses also :

An Amsler Planimeter (with revolving table), and a Thomas Arithmometer.

II.

PHYSICS

Professor Webster will deliver regularly, with a period of two years, the following cycle of unstarred courses. The starred courses have been given, or will be given, at irregular intervals. The lectures occupy from five to seven hours weekly.

1. DYNAMICS. GENERAL PRINCIPLES, CANONICAL EQUATIONS, METHODS OF HAMILTON AND JACOBI, SYSTEMS OF PARTICLES, RIGID BODIES.

2. NEWTONIAN AND LOGARITHMIC POTENTIAL FUNCTIONS, ATTRACTION OF ELLIPSOIDS.

2a.* FIGURE AND MOTION OF THE EARTH.

3. ELASTICITY, HYDRODYNAMICS, WAVE AND VORTEX MOTION, DYNAMICAL BASIS OF SOUND AND LIGHT.

3a.* DYNAMICS OF CYCLIC AND OSCILLATORY SYSTEMS, with APPLICATIONS TO THEORY OF ELECTRICITY, SOUND AND LIGHT.

3b.* THE THEORY OF RESONANCE WITH APPLICATIONS TO THE MEASUREMENT OF SOUND AND TO WIRELESS TELEGRAPHY.

4. ELECTRICITY AND MAGNETISM.

4a.* RECENT DEVELOPMENTS IN ELECTRICAL THEORY, INCLUDING THE THEORY OF LORENTZ.

5. OPTICS, PHYSICAL AND GEOMETRICAL. ELASTIC AND ELECTROMAGNETIC WAVE-THEORIES.

5a.* COMPARISON OF THE THEORIES OF THE ETHER.

6. THERMODYNAMICS, THERMO- AND ELECTRO-CHEMISTRY, KINETIC THEORY OF GASES, RADIATION.

7. THE PARTIAL DIFFERENTIAL EQUATIONS OF MATHEMATICAL PHYSICS.

Laplace's Equation, Equation of Thermal and Electrical conduction, Equation of Wave-motion, Beltrami-Lorentz Equation, Telegrapher's Equation, Methods of Cauchy, Green, and Rie-

mann, Developments in Series, Legendre's, Laplace's, Bessel's and Lamé's Functions.

8.* LINEAR DIFFERENTIAL EQUATIONS.

9.* ELLIPTIC FUNCTIONS, with certain physical applications.

10. ORTHOGONAL SURFACES AND CURVILINEAR CO-ORDINATES, and their applications.

The courses for the year 1907-08, will be 5-5a-6-7 (1, 2, 3, 4 have been given this year).

(The substance of courses 2, 3 a, and 4 is to be found in Dr. Webster's Treatise on the Theory of Electricity and Magnetism, Macmillan and Co., London and New York. That of courses 1, 2, 2 a, 3, 3 a is contained in his Treatise on Dynamics, B. G. Teubner, Leipzig.)

In addition to the above courses, there is held a weekly Colloquium, or meeting for the informal discussion of subjects not treated in the lectures and for the presentation of summaries of important articles appearing in the journals.

A part of the work of the colloquium consists in the systematic presentation of certain classical researches, connected more or less with the lectures, in preparing which the students make use of the original sources of information, thus gaining much experience in methods of research. The work of the colloquium has an excellent effect in training students to present their ideas in a systematic manner before an auditory.

In addition to the lectures announced above, advanced courses may occasionally be given on subjects not included in the list of starred courses.

The aim of the department is to insure in its students some acquaintance with all the various fields of experimental physics, to develop in them the power of exact measurement, to accustom them to exact reasoning from experiment to theory, and to encourage original research conducted on a sound basis. To this end students will

be put at work in the laboratory upon experiments of sufficient difficulty to give them skill in measurements of precision, and to enable them to become familiar with the precautions and corrections necessary to be employed in exact work. After a sufficient amount of experience has been gained, and the student has shown himself to be possessed of sufficient originality to warrant independent investigation, he will be encouraged to take up for himself an original research in the hope of making a personal contribution to science. In this research he will have at all times the benefit of the direction and advice of the professor.

In the belief that no sound knowledge of physics is at the present day possible without a clear appreciation of the means of expressing facts in accurate form, from which exact deductions may be drawn, much stress is laid on the acquisition of familiarity with the application of mathematical analysis to physics, and the courses of lectures are shaped with that end in view. These aim to give the student some acquaintance with the whole field of theoretical physics, to familiarize him with those general methods that appear in the various branches, and to show him how he may avail himself of them in practice. It is the constant endeavor in the lectures to bring out the physical essence that is concealed in the formulæ, in order that the student may recognize not merely the formula, in whatever department of physics it may occur, but the physical truth involved. As an instance may be mentioned the treatment of the partial differential equation of Laplace, whose meaning, whether in connection with distributions of Newtonian force, with the steady flow of heat or electricity, certain cases in hydrodynamics and sound, or in the theory of mag-

netic and electric induction, is physically the same, and indicates what was termed by Faraday the tubular, or solenoidal, distribution of a vector. Further examples are furnished by the geometrical properties of linear vector functions, of so frequent occurrence, and by the properties of such vector functions that one represents the "curl," or "rotation," of another.

Before all things, however, are made prominent the idea of Energy and its laws, so that in each department the subject is developed as far as possible from the mathematical expression of the energy involved. Physics may be defined as the Science of Energy and it is attempted, as far as possible, to make each portion of mathematical physics depend upon simple dynamical principles.

The value of a sound knowledge of dynamics to the student of physics cannot be overestimated, and the course in dynamics forms the natural foundation for the remaining courses.

It should be urged upon intending students to prepare themselves, not only in ordinary laboratory measurements, but also in mathematics, the lack of proper mathematical preparation being a serious drawback to the appreciation of the lectures. In particular may be recommended for study not merely those portions of the calculus which deal with the working out of many indefinite integrals, etc., but the theoretical portions which deal with the ideas of partial derivatives, definite integrals, and their practical manipulation, together with enough analytic geometry to involve the properties of lines and *surfaces* of the second order, and a fair amount of the elements of determinants. As suitable textbooks for preparation may be recommended to the stu-

dent Lamb's, Gibson's, Williamson's, or Byerly's Differential and Integral Calculus, C. Smith's Analytical Geometries, and Muir's or Hanus's Determinants. Appell, *Éléments de l'analyse mathématique*, may be very strongly recommended to the intending student for study before and during his course at the University.

It cannot be too strongly urged that the student should, from the beginning, be able to read French and German with ease and to make use of works in them.

REQUIREMENTS FOR THE DOCTOR'S DEGREE

1. The ability to read at sight specimens of scientific French and German, tested before the first of November preceding the doctor's examination by a committee of two members of the Faculty.

2. The successful passing of an examination upon the general subject of Experimental Physics¹ and upon the subjects named above in the regular course in Theoretical Physics, as a major requirement, together with an examination in one minor subject, to be determined in each particular case by the head of the Physical Department. This subject will be Mathematics or Chemistry.

3. The presentation of a satisfactory dissertation, involving a substantial amount of original work, and forming a contribution of value to pure science. The presentation of the dissertation is a prerequisite to examination.

The time of residence necessary for the proper fulfilment of the above requirements will generally be at least three years, of which at least one will be very largely devoted to work on the dissertation. Students will not be encouraged to enter upon the work of a dissertation until they have acquired sufficient experience to enable them to specialize with advantage.

The aim of the department is to produce physicists rather than electricians, acousticians, opticians, engineers, or narrow specialists of any sort, for although in the nature of things one

¹ Every student is recommended to provide himself with Winkelmann's *Handbuch der Physik* as a work for continual reference.

will be obliged to know more of one subject than of others, yet it seems evident that no thorough knowledge of any branch can be gained without a comprehensive view over the whole subject. Without this the specialist, or the experimentalist lacking a knowledge of mathematics, will continually be falling into pitfalls which the more wary avoid. Furthermore, it can be but a detriment to science to encourage research in new fields by immature and ill-prepared minds and hands.

The following statement is here inserted for the benefit of students of mathematics.

The minor in Mathematical Physics consists of the subject-matter of courses 1, 2, 3 and 7, which are intended to constitute the equivalent of five hours a week for one year. Course 7 is given in alternate years to the other courses. The subject-matter of the course is contained in Dr. Webster's treatise on *dynamics* and Riemann-Weber's *Partielle Differentialgleichungen*.

FACILITIES

At the beginning of the year 1903-04 the Physical Department was moved from the rooms it formerly occupied in the main building to the unoccupied wing of what was formerly known as the chemical building, which was remodelled to accommodate the department. This affords convenient and commodious quarters separate from all other departments, and quite free from disturbance, the chemical laboratories being in the other wing separated by a tight partition. On the ground floor is a room extending across the end of the building, with windows on three sides, forty-five feet long by twenty-two feet wide, above which are three other similar rooms. A lift running from the bottom to the top floor affords a means of transporting apparatus, while its shaft furnishes space for manometer or barometer tubes. In the lower room are four piers with heavy stone tops, and two others below the floor on which can be placed heavy tables. The other rooms on the ground floor are a large dark room, partially below ground, in which the temperature is tolerably constant, containing a very large and heavy pier. The

engine and storage-battery room containing a high-speed steam-engine connected with the heating boiler and a kerosene engine on the same foundation, with the dynamo between, and seventy-five cells of storage-battery, furnishes the power supply. The storage-cells are conveniently arranged so that each one is accessible from each side, above and below, and the ventilation is excellent, while the room is as light and clean as the work-rooms. Distributing switch-boards enable the current from the dynamo or any section of the battery to be supplied to any of the rooms. On the same floor are three rooms constituting the work-shop, one of the most important parts of a research department of physics. The first room is devoted to wood-working and pattern-making, and accommodates also a bench for soldering. The next room contains the machinist's bench, two engine lathes, jeweller's lathe and planer, and the third room a Rivett precision bench lathe. There is no countershafting in the building, each tool being driven by a separate electric motor, while the capacity of the battery is such that for ordinary purposes it is not necessary to drive the engine for the shop alone, so that perfect quiet and steadiness are ensured. In the shop are executed all repairs and alterations of apparatus, and in addition is constructed the new apparatus requiring continual experiment. Most of the principal pieces of apparatus belonging to this department have been here constructed. In this manner, by having a mechanic always present, an extremely great economy in time and money is effected, and vexatious delays, which would otherwise completely arrest the progress of the work, are avoided. Facilities are also given for the students to construct apparatus for themselves.

On the main floor are the lecture room, the director's office, the large room used as the director's private laboratory and apparatus room, and three other convenient rooms for research. Two of these are arranged so that they may be darkened for photography, and are also fitted with chemical hoods. The large room on the top floor is intended to be used for optical purposes. Every room in the laboratory contains sinks, gas and electric light connections, and several circuits connecting with the switch-board in the battery-room.

The laboratory is well equipped with apparatus for research,

besides having the facilities above described for the construction of instruments of any sort needed for that purpose. In addition may be mentioned a large collection of diagrams illustrative of mathematical physics, many of them being originals of the figures in Dr. Webster's "Electricity and Magnetism" and "Dynamics," and a number of interesting models used in teaching dynamics, thermo-dynamics, and electricity, the number of which is continually increasing, and some of which are rarely found. Among these are Maxwell's Dynamical Top and a number of other interesting tops, Rayleigh's induction model, Gibb's and other thermo-dynamical surfaces.

THE LIBRARY

Among the most important of the facilities of any department is of course to be named the library, and among the first questions naturally asked may be expected those relating to the accessibility of books to students and the conditions regarding their use.

The library of the Physical Department is large and carefully selected and, in mathematical physics particularly, may fairly be said to contain the best works. Among others may be mentioned:

Collected Writings of Helmholtz, Hertz, Clausius, Kirchoff, Kelvin, Lorentz, Green, Hopkinson, McCullagh, Joule, Stokes, Maxwell, Rankine, Rayleigh, Regnault, Reynolds, Rowland, Tait, Young, Gauss, Fourier, Leplace, Cauchy, Foucault, Fresnel.

Potential Electricity and Magnetism. Riemann, Betti, Dirichlet, Mathieu, Somoff, Kirchoff, Neumann, Minchin, Routh, Clausius, Duhem, Maxwell, Boltzmann, Drude, Mascart and Joubert, Watson and Burbury, Gray, Heaviside, Thomson, Poincaré.

Elasticity. Mathieu, Ibbetson, Love, Todhunter and Pearson, Williamson, Clebsch, Neumann, Lamé, Boussinesq, Résal, Poincaré.

Hydrodynamics. Bassett, Lamb, Kirchoff, Neumann, Poincaré, Wien.

Light. Mascart, Kirchoff, Helmholtz, Neumann, Wood, Volkmann, Drude, Résal, Poincaré, Bassett, Curry, Preston, Schuster, Walker.

Heat. Clausius, Helmholtz, Kirchoff, Planck, Rühlmann, Boltzmann, Voigt, Zeuner, Bertrand, Duhem, Poincaré, Preston.

Sound. Rayleigh, Donkin.

A large number of treatises on Mechanics, a set of the *Travaux et Mémoires du Comité International de Poids et Mesures*, and of the published memoirs of the *Physikalisch-technische Reichsanstalt*, may also be mentioned.

Among the journals are complete sets of the

Annalen der Physik und Chemie.

Annales de Chimie et de Physique.

Comptes Rendus.

Eclairage Electrique.

Journal of Physical Chemistry.

Nature.

Philosophical Magazine.

Philosophical Transactions.

Physical Review.

Physikalische Zeitschrift.

Proceedings of the Royal Society.

Science.

Science Abstracts.

Zeitschrift für Instrumentenkunde.

The library subscribes to the following journals:

American Journal of Science.

Annalen der Physik.

Beiblätter zu den Annalen der Physik.

Annales de Chimie et de Physique.

Comptes Rendus.

Eclairage Electrique.

Electrical World.

Electrician.

Elektrotechnische Zeitschrift.

Fortschritte der Physik.

Journal of Physical Chemistry.

Journal de Physique.

Nature.

Il Nuovo Cimento.

Philosophical Magazine.

Philosophical Transactions.

Physical Review.

Physikalische Zeitschrift.

Proceedings of the Royal Society.

Science.

Science Abstracts.

Verhandlungen der Deutschen Physikalischen Gesellschaft.

Zeitschrift für Instrumentenkunde.

III

CHEMISTRY

The courses in chemistry leading to the degree of Master of Arts are intended to provide work of an advanced nature which shall supplement the elementary work of the undergraduate in such a way as to give the student a broader and more comprehensive view of the subject. At the same time it is intended to encourage in the student a desire for independent investigation, and to offer opportunity for doing specialized work. The work in its general nature falls into the two following groups:

I. Courses of lectures and laboratory work designed to increase the student's general knowledge of chemistry, including such subjects as the chemistry of the rare elements, usually not treated in elementary courses; methods of making pure preparations; analytical methods, qualitative and quantitative; electro-chemistry; optical and photo-chemistry and other special branches of physical chemistry; organic preparations and special methods of organic analysis.

II. Research courses in which the knowledge already acquired is applied to the acquisition of further knowledge through the agency of original investigation.

The laboratory work is much more individual in character than is possible in elementary work. The student is encouraged to undertake that line of work in which he is especially interested, and opportunity is offered to take up any special subject desired, under the direc-

tion of the instructor. The laboratory work will thus be varied to suit the needs of the individual and will partake more of the nature of independent investigation than is possible with the prescribed work of elementary courses. This work will be supplemented by lectures dealing with the theoretical aspects of the subject, and accompanied by general reading and seminary work.

The exact nature and amount of work required for the degree of Master of Arts will be determined individually. In general, it will be work of advanced grade to occupy most of the student's time for one year. This work may be all in this department, or it may be partially in one or more other departments, with the approval of the instructors in those departments.

The lecture course will be varied from year to year to meet the requirements of students. For 1907-1908 the following courses will be offered by DR. MERIGOLD:

ADVANCED INORGANIC CHEMISTRY. Lectures and laboratory work dealing with special analytical methods; sources of error; the chemistry of the rare elements; preparation of pure inorganic compounds; optical chemistry, including the theory and application of the polariscope, refractometer, spectroscope, and microscope as aids to chemical work. Special consideration will be given in the lectures to the theoretical side of these subjects. The laboratory work may be varied to include any subject along these lines in which the student may be interested.

ELECTRO-CHEMISTRY. Lectures and laboratory work dealing with the modern theories of electro-chemical action, including electrolytic action in aqueous and non-aqueous solutions and fused salts; the electrolytic dissociation theory and its application; the laws governing the chemical production of current and electromotive force. Attention will also be given to the more important applications to analytical and synthetical methods, and to technical processes involving electro-chemical action.

An elementary knowledge of the general principles of physical

chemistry, electricity and electrical measurements, is a prerequisite for this course.

PHYSICAL CHEMISTRY. Lectures and laboratory work. A general elementary knowledge of the subject is presupposed.

SEMINARY. Reports and discussion of contemporaneous work appearing in current journals, and presentation of special topics.

RESEARCH. Students may take up any line of chemical investigation for which previous work has fitted them.

Candidates for the degree who are specializing in chemistry, may, if desired, devote all their time to any one of the subjects outlined above, with the exception of the seminary work, which is required of all who make chemistry a major subject.

While a certain amount of laboratory work illustrative of the lecture work is given, it is expected that candidates for the Master's degree will devote the major portion of their laboratory work to some line of original investigation.

Students for whom chemistry is a minor subject may take up any course for which their previous training has prepared them.

In the laboratory work students are expected to become familiar with the literature bearing upon their subject. Consequently a reading knowledge of French and German is essential.

In special cases, when satisfactory reasons exist, either the lectures or the laboratory work of the lecture courses may be taken separately.

IV.

BIOLOGY

PROGRAMME FOR YEAR 1907-1908

Dr. Hodge will offer the following courses:

I. DYNAMIC BIOLOGY AND GENERAL PHYSIOLOGY. It is proposed to combine in this course the fundamental laws and principles of biological science, the emphasis being placed on the functional or dynamic side rather than on the side of morphological structure. In other words, the point of view of the course is that living species have assumed certain forms and have developed definite structures in order to fit them to perform a certain work in the economy of nature. Among others, the following topics will serve to outline the scope of the course. Origin and constitution of living matter. Physiological functions. Classification of plants and animals. Biological reactions, tropisms, experimental morphology. Differentiation of organs. Growth and reproduction. Heredity. Variation. Specialization. Evolution. One lecture weekly, October to June. Laboratory work will be arranged to meet the needs of individual students.

II. BIOLOGICAL EDUCATION. The University stratum—history, aims and methods of biological research. The College level—outlines of college courses and history of their development. Biology in the high school. Biological nature study for the elementary schools. Eight lectures, to be arranged for by consultation during the year.

III. A biological seminary will be held one evening weekly throughout the year. In general the work of this seminary is planned to run on a three-year cycle as follows: first year, history of science and of biological research; second year, philosophy and historical development of evolution; third year, the laws of heredity and variation. The year 1907-1908 will be the second year of the cycle.

NEUROLOGY

It is intended to arrange the course in such a manner that the general field may be covered in two years. This will leave the student free to devote his entire time during the third year to special study in the literature of the science and to the prosecution and completion of his thesis work. Accordingly, a two-year cycle will be arranged as follows:

IV. COMPARATIVE STUDY OF NERVOUS SYSTEMS AND SENSE ORGANS. This course will form the natural basis for comparative psychology and together with the working out of a minor problem may well constitute a minor for one whose major is psychology or philosophy. On the biological side it will be closely correlated with general physiology and morphology. It is intended to begin with a comparative study of the structural elements of the nervous system of both invertebrates and vertebrates and then correlate and compare the differing degrees of complexity of function with the anatomical organization found in the ascending series. The course will be illustrated throughout by diagrams, models, dissections and microscopical preparations and experiments. Laboratory work one afternoon weekly, or will be arranged to meet the needs of individual students. One hour weekly for general class exercise, or its equivalent.

V. THE HUMAN NERVOUS SYSTEM AND SENSE ORGANS. This course will deal with the anatomy, both gross and microscopic, and with the physiology and hygiene—fatigue and sleep, growth and development, localization—of the brain. One hour weekly, or the equivalent. Laboratory one afternoon a week, or arranged to meet the needs of individual students.¹

By way of supplementing the above and courses in other departments of the University, two special courses have been planned as follows:

VI. PRACTICAL HISTOLOGY. The course will be a laboratory course, with such lectures, directions and conferences as

¹ For elementary courses in special physiology, histology and hygiene, refer to announcement of biological courses in the Collegiate Department.

may be required by those taking it. It will be arranged practically to meet the needs of individual students. Considerable latitude will be given, so that any who wish may make it a comparative study by way of supplementing course I, prepare a series of demonstrational specimens for themselves, or devote their time to special problems.

VII. For those who do not take work in the laboratory, but desire to see the actual specimens and experiments, a course of demonstrations to run somewhat parallel with the above courses will be offered. One hour weekly, through the year.

EXPERIMENTAL WORK

Laboratory work in biology, physiology, histology, and neurology is arranged to meet the needs of individual students. Its general purpose is to facilitate practical familiarity with methods of research, and as soon as practicable each student is expected to begin an original investigation. Standard apparatus of most improved types is at the disposal of the laboratory, and when new work requires specially devised apparatus, every effort within the means of the department is made to obtain it. The aim of the laboratory is thus to place at the disposal of those interested in the solution of physiological and neurological problems the best obtainable facilities for the prosecution of their work. In case one has not decided on a special line of research, the resources of the department are such that he will be given a fairly wide range of problems from which he may select a subject suited to his tastes and attainments. A course in biology such as is given in our best colleges and State universities is sufficient to enable students to begin work here.

While no regular laboratory fees are charged, each student is expected to refund to the laboratory the cost

price of all the more expensive reagents, including alcohol, ether, chloroform, formalin, celloidin, and the like. Each student must supply his own microscopical glass, slides and covers, and must pay the cost price of all glassware that he breaks. All students are expected to take the best possible care of all apparatus entrusted to their charge, and to return it to the laboratory clean and in good order.

The library of the department has been selected with two important considerations in view. The first of these is to obtain the standard classics in the science. The second is to keep abreast of the times by having the best recent literature readily accessible both for study and reference. This latter class of selections thus includes monographs and text-books and current numbers of journals, with complete files of many of the more important. A complete set of indexes, Jahresberichte and Centralblätter greatly facilitates the work of referring to the literature of topics under investigation in the laboratory.

THE JOURNAL CLUB meets weekly, for the purpose of reporting and discussing important articles in the current periodicals.

A complete list of the Journals will be found in the *Publications* of the Library.

V.

ANTHROPOLOGY

DR. CHAMBERLAIN will lecture twice a week throughout the year. The courses offered will be selected from the following :

A. GENERAL ANTHROPOLOGY, embracing: (a) HISTORY, scope and relations of the science. (b) PHYSICAL ANTHROPOLOGY; problems, investigations, results, laboratory work. (c) ETHNOGRAPHY; races and race-origins. (d) ETHNOLOGY, INCLUDING SOCIOLOGY; origin and development of the arts and sciences, institutions, mythology, folk-lore, religions. (e) LINGUISTICS; race and language, origin and development of language and of languages, psychology of language, gesture-speech and written language, comparative linguistics, comparative literature. (f) CRIMINAL AND PATHOLOGICAL ANTHROPOLOGY: physical and mental, ethnic morals. (g) HISTORICAL AND ARCHÆOLOGICAL; primitive man and primitive culture, the precursors of man.

B. SPECIAL COURSES upon Anthropological Topics most akin to Psychology and Pedagogy, embodying the results of the most recent and important studies and investigations of the following and other subjects, particularly the characteristics of the primitive races and their rôle in human history. The Physical Anthropology of Infancy, Childhood, Youth, Manhood, Old Age; the Anthropological Phenomena of Growth, Arrested Development, Degeneration; Anthropological Aspects of Heredity and Environment in the Individual and in the Race; Uncivilized Races and Civilized Races; the Phenomena of Race-Mixture; the Evolution Problems of Humanity; Education among Primitive Peoples; the Anthropological History of America; the Interpretation of Folk-lore; the Psychology of Primitive Peoples; the Trend of Human Progress; the Psychology of Primitive Languages; the Mind of Primitive Man and its Expressions;

the Rôle of the Individual in Primitive Culture ; Progress and its Criteria ; the Orient and the Occident in their Relations to Human Evolution ; the Negro in Africa and in America ; the American Indian.

The lectures in Anthropology will have special bearing upon the courses in Psychology and Pedagogy in the University, and every effort will be made to utilize the latest results of Anthropological investigations.

From time to time, the most valuable current literature will be reviewed and students made acquainted with the best contributions to Anthropological Science in the various foreign languages. The importance of a thorough acquaintance with the bibliography of their subjects is impressed upon all students, and all possible assistance in this direction is always at their disposal.

VI

PSYCHOLOGY

A complete course in Psychology at Clark University includes the following subjects :

I. Anatomy and Physiology of the Brain and Spinal Cord; senses, and other parts of the body, especially the muscles, the organs of the will, so far as they affect psychological powers and processes, with a good general background of biology. For this a special laboratory is equipped. See Dr. Hodge's announcement.

II. Physiological and Experimental Psychology, including Reflex Action; Fatigue and Rest; Sleep; Hypnotism; Automatism; Temperaments; Interaction of mind and body generally. Laboratory methods and apparatus for the study of the Senses, Reaction-time, Memory, Attention, Association, Will, Feelings, etc. For this a special laboratory is equipped. See Dr. Sanford's announcement.

III. Comparative and Genetic Psychology. Observation and experiments upon the mental processes of lower animals, including both microscopical and larger forms, and especially (when practicable) the observation of dawning intelligence during animal infancy; questions of instinct and psychical heredity; and the parts of the general field common to biology and psychology. See announcements of Dr. Hall and Dr. Sanford.

IV. Abnormal and Morbid Psychology, as nature's experiments, *e. g.*, Border-line phenomena as seen in neurotic people, prodigies, and geniuses; Defectives, such as the blind, deaf, criminal, idiotic; Mental and Nervous diseases, epilepsy, phobias, neurasthenia, hysteria; Morbid modifications of will, personality and emotion, etc. Special clinical facilities for this work are open to the department in the hospitals and other institutions of the city. See Dr. Hall's lectures and Dr. Cowles's lectures and clinic.

V. Anthropological Psychology; Myths, Custom and Belief, Comparative Religion and Psychology of Religion, Primitive

Art, and the study of the life of savages and children; Adolescence and senescence; Physical measurements illustrating laws of growth in size and power, etc. See Dr. Chamberlain's courses.

VI. *Æsthetics and Ethics*, the psychology of music, painting, literature, the phenomena and laws of volition and morality.

VII. *History of Psychology and Philosophy*, including the chief culture institutions, science, medical theories, Christianity, and education generally. Dr. Hall's historical courses and seminary.

VIII. *Applications of Psychology, Pedagogy*, including mental and moral hygiene and regimen, school organization and methods from kindergarten to university; the sex problem; defectives, etc. Dr. Hall's and Dr. Burnham's courses.

The aim of the Psychological department is to cover this field as well as its instructors are able to do so in two or three years.

THE PSYCHOLOGICAL LABORATORY consists of a suite of eleven rooms on the third floor of the main building, devoted to the following purposes: 1, Lecture Room; 2, Large Dark Room; 3, Seminary and Departmental Library; 4, Office of Director; 5, Apparatus and preliminary setting up of apparatus; 6, 7 and 8, Rooms for demonstration and research; 9, Shop; 10, Photographic Dark Room; 11, Room for the keeping of animals and for Comparative Psychology. In floor space and favorable situation the Laboratory leaves little to be desired.

The department is well supplied with apparatus for both demonstration and research, and has access also to the collections of the physical and biological departments, and that of the psychological department of the College. Many pieces have been manufactured at the University and a considerable number have been designed here for special researches. The collection is constantly increasing by purchase or construction, especially in apparatus for research.

The Psychological section of the Library is full on EXPERIMENTAL AND PHYSIOLOGICAL PSYCHOLOGY, and upon THE PSYCHOLOGY OF RELIGION and the STUDY OF CHILDREN. The section on criminology and related topics is also large. All the more important psychological journals in English, French, German and Italian are received regularly at the University and complete sets of the most important are upon the shelves of the library.

The following courses are announced for the academic year 1907-1908.

DR. HALL'S COURSES

Dr. G. Stanley Hall will give the following courses:

I. THE HISTORY OF ANCIENT PHILOSOPHY beginning with the Greeks and coming down to the end of the Alexandrian and the Patristic Period. One hour a week.

II. INFANCY AND CHILDHOOD. A systematic and comprehensive survey of children from birth to adolescence, with references to and demonstrations of the literature and with incidental applications of results of education. One or two hours a week.

III. PSYCHOLOGICAL EVOLUTION IN ANIMALS AND MAN. The genesis of animal instinct and the natural history of man down to the Prehistoric Period. This course will treat of the genealogy and natural history of the human race, beginning with the upright position and including primitive industries, myths, customs and life, with archeological references. One hour a week.

IV. Religious Psychology and the Psychology of Jesus. One hour a week.

V. The Pedagogy of different topics of education in the primary and grammar school, with some references to college and university work. One hour a week.

VI. Seminary, at his home, three hours every Monday evening throughout the year. Papers read and criticised by students.

VII. Research with individuals on special subjects.

DR. SANFORD'S COURSES

The following courses or their equivalents will be given by Dr. Sanford:

1. *Comparative Psychology. The Evolution of mind in the race and the individual.* General theory of evolution; review of the facts of psychogenesis; discussion of applications to human mental progress. Three hours a week, first half-year.

2. *Theory and Practice of Psychological Measurements.* Mathematical foundations of the statistical methods in common use in experimental psychology. The psychophysical methods. Means of establishing correlation. Informal lectures with practice in psychological calculations. Three hours a week, second half-year.

3. *Psychological Seminary.* Reports and discussions on topics of current psychological interest. The work in the Seminary is informal and is varied to suit the needs of those attending it. One hour a week, throughout the year.

4. *Laboratory Practice Course.* Introduction to the use of standard pieces of apparatus and established methods. Informal lectures and laboratory practice. Six hours a week, throughout the year.

5. *Research.* Advanced students are directed in research upon topics in Experimental and Comparative Psychology by Dr. Sanford. The laboratories are open for advanced work at times suited to the convenience of those engaged in it.

PSYCHIATRY

Dr. Cowles, former head of the McLean Hospital at Waverley, Mass., lecturer on psychiatry, will give a course at the University and clinical demonstrations at the Worcester Insane Hospital.

Dr. Cowles's course for the year 1906-1907 has included the following topics:

1. The dependence of psychiatry upon psychology as essentially the study of mental function and its disorders in the domain of physiology.

2. The relation of psychology and psychiatry to the prevailing

morphological conceptions of general medicine and the difficulty of harmonizing them.

3. Mental physiology; imperative ideas, obsessions, and psychological automatism.

4. The mental symptoms of nervous exhaustion. Forms of mental diseases—(mental symptoms essentially constituting the disease-forms).

5 and 6. The "symptomatic and functional" psychoses (not tending to dementia). The phases of "melancholia" and "mania;" "confusional insanity."

7 and 8. The deteriorating psychoses (tending to dementia), dementia præcox (hebephrenic, katatonic, and paranoid forms), paresis, senile dementia.

9. The chronic psychoses (not tending to grave dementia). Involution psychoses. Primary delusional insanity,—paranoia.

10. Insanities from mental defect. Imbecility, idiocy, moral insanity.

DR. COWLES'S lectures are open without fee

(1) To all members of the Faculty of the University and College;

(2) To all members of the Psychological Department, and to members of the College who are taking other psychological courses in the University.

The fee for all other persons is \$5.00.

VII

PEDAGOGY

This department offers a course which can be taken as a minor for the degree of Doctor of Philosophy. Its work is in the closest connection with that of psychology and anthropology, and in part based on these subjects. The work in this department is intended to meet the needs of the following classes of students.

First. Those intending to teach some other specialty, but who wish a general survey of the history, present state, methods, and recent advances in the field of university, professional and technical education.

Second. Those who desire to become professors of pedagogy, or heads or instructors in normal schools, superintendents, or otherwise to become experts in the work of education.

The programme of the Pedagogical Department includes courses upon the following subjects:

I. (a) CHILD STUDY. (b) PEDAGOGICAL PSYCHOLOGY. (c) SCHOOL HYGIENE.

II. (a) PRINCIPLES OF EDUCATION. (b) HISTORY OF EDUCATION AND REFORMS. (c) METHODS, DEVICES, APPARATUS, ETC.

III. (a) ORGANIZATION OF SCHOOLS IN DIFFERENT COUNTRIES. (b) THE TEACHING PROFESSION. (c) MOTOR EDUCATION, including manual training, physical education, etc. (d) MORAL AND RELIGIOUS EDUCATION. (e) IDEALS.

The courses in Pedagogy for 1907-1908 will be as follows:

DR. BURNHAM'S COURSES

A. THE HYGIENE OF THE SCHOOL CHILD. This course is supplementary to the course on the hygiene of Instruction given in 1904-05. Some of the more important chapters in modern school hygiene will be considered, including such topics as: The conditions that determine growth and development. The general principles of somatic and mental hygiene. The hygiene of the senses. Modern studies of defects of sight and hearing. School diseases. The hygiene of the voice, the mouth, the teeth, the nose. Mental diseases and faults of children. Neuroses of development. Tests of ability to work and of physical condition. Medical inspection. The hygiene of discipline. The development of healthful mental activity. Hygiene of memory, of attention, and of feeling. The hygienic aspect of some psychological studies. *Once a week, Saturdays, throughout the year.*

B. EXPERIMENTAL PEDAGOGY. A résumé of important results of recent experimental studies. The general point of view of experimental pedagogy. The contribution of experimental psychology to pedagogy. Experiments on the learning process, the acquisition of motor habits, the acquisition of technical skill, telegraphy, piano-playing, etc. Experimental studies of memory and of testimony. Experimental studies in reading, arithmetic, writing, etc. Tests of intelligence. The significance and value of experimental studies in pedagogy. Practical results. *One hour a week, half a year.*

C. PRINCIPLES OF EDUCATION. This course treats certain fundamental educational principles and involves also a study of several important chapters in the history of education, with a brief account of a few representative educational systems. Such topics as the following will be included: Educational ideals. The dominant aim at different stages of development. The correlation of educational forces. The family and education. The church and education. State aid and control. The field of scientific study in education. Antithetic educational principles. The history of nature versus convention in Education. Rousseau. Pestalozzi as "pedagogical socialist." Modern

Social-Pædagogik. Present problems and tendencies. *One hour a week, half a year.*

D. SEMINARY. The work will be determined in part by the needs of the students who elect this course. It will probably be devoted chiefly to some phase of the history of education. It is hoped, also, that each student will select, after consultation with President Hall and Dr. Burnham, a topic for special investigation. The results of such studies may be published. *One or two hours a week throughout the year.*

PRESIDENT G. STANLEY HALL'S COURSE

The pedagogy of different topics in primary and secondary education with demonstrations of elementary text-books, apparatus and various other illustrative material.

This and Dr. Burnham's Saturday work constitute a special course open to teachers as well as to members of the University.

The courses as announced above may be modified somewhat as the needs of the students or other circumstances may require.

The library of the department has a large collection of EDUCATIONAL LITERATURE, being especially rich in German and French literature, and having a large number of official reports from various countries—English, French, German, Belgian, Swedish, etc.; also town and city reports, and reports of special institutions; and a collection of French, German, and American text-books.

The books are arranged under the following heads:

1. GENERAL.
2. HISTORY OF EDUCATION.
3. EDUCATIONAL SYSTEMS.
4. THE THEORY OF EDUCATION AND SPECIAL SCHOOL SUBJECTS.
5. EDUCATIONAL PSYCHOLOGY.
6. CHILD STUDY.
7. SCHOOL HYGIENE AND PHYSICAL EDUCATION.
8. TEXT-BOOKS.
9. MISCELLANEOUS.

Many of the more common educational books are accessible in the Worcester Public Library and have not been duplicated by the University. The large collection of educational text-books in the library of the American Antiquarian Society and its valuable historical material are also accessible to the University.

The collection of educational periodicals includes a large number of the best foreign journals—English, French, German, Swedish, etc.

The nucleus of an educational museum has been formed, which contains a valuable collection of EDUCATIONAL APPARATUS, pictures and other material for language lessons and *Anschaunungsunterricht*, maps, charts, diagrams, models, illustrative material in school hygiene, etc.

The *Pedagogical Seminary* is a journal issued at the University, and serves as a convenient medium of publication for special investigations undertaken in the department.

SPECIAL STUDENTS IN EDUCATION

In addition to the members of the University, special students are admitted during the year to the Saturday courses of Drs. Hall and Burnham in Education, for a fee of \$20.

VIII.

ECONOMICS AND SOCIOLOGY

The degrees of Master of Arts and Doctor of Philosophy will be offered in this department both in Economics and in Sociology.

The degree of Master of Arts will be given both in Economics and in Sociology for the completion with credit of a course of study approved by the department. Such a course may be composed of a major in Economics and a minor in History, or of a major in Sociology and a minor in Psychology. The requirements, however, will be made sufficiently elastic to suit the needs of individual students.

For the degree of Doctor of Philosophy in either Economics or Sociology, the courses enumerated below, or their equivalents, will be accepted as the major requirement. Students expecting to take the degree in Economics, however, are advised to do their minor work in History; and students expecting to take the degree in Sociology are advised to do their minor work in Psychology, Anthropology, or Biology. The minor work will constitute about one-third of the work required.

The ability of students to do satisfactory research work will always be considered the most important qualification for the Doctor's degree.

Within a period of three years all the following courses will be offered, and each year such courses will

be given as the interests and needs of the students require.

1. Advanced Theory of Economics.
2. History of Economic Theory.
3. Theory and Use of Statistics.
4. Labor Problems, including Labor Legislation.
5. Theory of Sociology. (See announcement in Collegiate Department.)
6. Literature of Sociology, including the leading theories of the present day.
7. Social Problems, including suicide, divorce, migration of population, fecundity of population, intemperance, pauperism, crime, etc.
8. History of the Theories of Socialism and Communism.
9. Scope and Method of the Social Sciences.
10. Seminary.

For the year 1907-1908 the following courses are offered.

BY PROFESSOR WRIGHT

3. THEORY AND USE OF STATISTICS.

Population: Its composition; Immigration; Arrears, urban and rural; Births; Deaths; Marriages; Divorces.

Statistics of Crime: Pauperism; Benevolences, etc.

Statistics of Agriculture: Commerce; Finance.

Statistics of Manufactures: Capital; Products; Cost of Production; Efficiency of labor; Labor cost, etc.

Wage Statistics: Difficulties attending them; Money wages; Real wages; Cost of living; Rates and earnings; Purchasing power of money.

4. LABOR PROBLEMS.

Under this general title the various features and elements of industrial society will be discussed; including Systems of labor; Evolution of manufactures; The factory system; The regulation of industry by states and individuals; Communism; Municipal socialism; Social democracy and state socialism; Strikes and lockouts; Industrial conciliation and arbitration; Government by injunction; Employers' liability and other features of the labor problem.

10. SEMINARY.

BY DR. BUSHEE

5. THEORY OF SOCIOLOGY. (See announcement in Collegiate Department.)

And one or more of the following courses :

1. ECONOMIC THEORY during the 18th and 19th Centuries. The theories of the early economists will be studied with reference to the economic conditions under which they were formulated. The major part of the course, however, will be devoted to recent economic literature and to the present trend of economic thought. *2 hours.*

6. LITERATURE OF SOCIOLOGY. In this course a critical examination will be made of the contributions of the leading sociologists beginning with Auguste Comte, with reference both to their general theories and to their special contributions to the science of Sociology. Other authors to be studied will include Spencer, Ward, Giddings, Loria, De Greef, Gumplowicz, Coste, Durkheim, Kidd, Tarde, and Simmel. This course presupposes a knowledge of the general principles of Sociology. Those who have not had such preparation may advantageously take the introductory course given in the Collegiate Department. *2 hours.*

7. SOCIAL PROBLEMS, including suicide, divorce, migration of population, fecundity of population, intemperance, pauperism, crime, etc.

8. SOCIALISM AND COMMUNISM. This course will consist in an historical survey of the theories of the leading Utopian and scientific Socialists and in a critical examination of the practical experiments in Communism which have been made in the United States and in foreign countries. Special attention will be given to the development of the three leading principles of scientific socialism, the materialistic conception of history, the theory of value, and the class-conscious struggle. These principles will be studied as represented by Marx, Engels, Kautsky, Bebel, Vandervelde, Labriola, Bernstein, Vollmar, Jaurès, and by the English Fabians. *2 hours.*

10. SEMINARY IN ECONOMICS AND SOCIOLOGY. Students entering the Seminary will be directed in research work in topics in Economics or in Sociology. Special subjects outside of the regular courses will be discussed and some of the periodic literature will be reviewed.

IX.

HISTORY

Dr. Blakeslee will offer the following courses :

1. CONTEMPORARY HISTORY.

Students who wish to do graduate work in history will be expected to possess a sufficiently broad knowledge of the general field so that they may be able, with intelligent appreciation, to take up the study of special topics. The subjects to which the department will give particular attention are those which have a real importance at the present day. The students may gain the necessary information in the various subjects from the lectures and from extended reading ; the preparation of papers, reports, and theses will give the training which will enable them to take up any new historical subject which may challenge public attention, present its important features clearly and accurately, and show its relations to the events and the great world movements of the past.

The subjects recently studied have been : Russia,—political, social, and constitutional development, with emphasis upon the causes and the events of the present revolution ; the Congo Free State, particularly a critical study of the evidence relating to King Leopold's misgovernment ; the history of the American Negro and the present Negro problem ; the Awakening of China,—its international relations and recent social and cultural development ; and the Government of Dependence, including such topics as Race Psychology and the problems of the social, economic, and religious education of primitive peoples.

Each year one of the following courses will probably also be given :

2. INTERNATIONAL LAW.

The aim of this course will be to give a knowledge of the general principles of International Law. So far as possible definite

cases will be studied, and for that purpose Scott's "Cases on International Law" will be followed. Especial attention will be paid to the legal questions involved in the Russian-Japanese controversy; to the history and present status of arbitration; and to the modification in International Law introduced by such international Congresses as those held at the Hague. The study of leading authorities and cases will be supplemented by lectures, discussions and thesis work.

3. ENGLISH HISTORY—the Period of the Tudors and the Stuarts.

The course will extend from the accession of Henry VII, in 1485, to the death of Queen Anne, in 1714, and will deal especially with the establishment of practical absolutism under Henry VII and Henry VIII; the rise of Protestantism; the development of Puritanism in State and Church; the great Civil War; Cromwell and the Puritan Ascendancy; the attempts to form a firm constitutional government; the relation of English Puritanism to that of Switzerland and New England; the restoration of monarchy; and the final triumph of Parliament in the overthrow of James II.

4. THE HISTORY OF THE CHRISTIAN CHURCH.

This course will give a general history of the Christian Church from the days of the Apostles up to the present time. The leading topics considered will be: the pre-Constantine church, including the persecution and the formation of a definite ecclesiastical organization; the effects upon the church of Constantine's conversion; the Nicene Creed and the early heresies; the conversion of the barbarians and its reflex action upon the church; Monasticism; the rise of the Papacy; the Mediæval Church at its height; the rise of heresy—Wyclif, Huss, Savonarola; the reformation—Luther, Zwingli, Calvin; the Catholic Reformation; the religious wars of the sixteenth and seventeenth centuries; the Puritans; and a survey of the history of the leading Protestant denominations. The purpose of the course will be to give a clear conception of the history of the church as a whole, not to deal in detail with any single period.

5. ECONOMIC HISTORY OF EUROPE.

The aim of the course will be to give a general account of the rise and development of the leading economic and social institu-

tions of Europe. Some of the subjects considered will be: the manor; the different systems of land holding; serfdom; the merchant and craft guilds; the domestic and factory systems of industry; town life and the Hanseatic League; the rise of commerce and the struggles for world commercial supremacy; and the economic importance of colonies. Especial attention will be paid to English conditions. This course will be of particular assistance to students of economics.

6. UNITED STATES HISTORY. Different subjects for this course may be taken in succeeding years such as: Colonial Possessions of the United States including a sketch of the history of the Dutch, Spanish and Portuguese colonies, and a comparison of their problems, successes and failures with those of the United States in the Philippines and Porto Rico; the history of the United States from the Missouri Compromise to the outbreak of the Civil war, with especial emphasis upon the years following the compromise of 1850; and the students will be expected to present reports upon topics assigned by the instructor; these reports will then form the basis for a critical discussion.

LIBRARY

The Library is under the control of a Library Committee, appointed by the Trustees, of which the President of the University is *ex-officio* chairman. The duties of this committee are to advise concerning the arrangement, cataloguing, use of books, and other matters pertaining to the Library not reserved to the Trustees nor otherwise provided for.

LIBRARY COMMITTEE

PRESIDENT G. STANLEY HALL, *Chairman*

PRESIDENT CARROLL D. WRIGHT

PROFESSOR WILLIAM E. STORY, *Secretary*

LIBRARY STAFF

LOUIS N. WILSON, *Librarian*

ASSISTANTS

MARY S. TERWILLIGER, *Senior Assistant*

EDITH M. BAKER

JENNIE L. KNIGHT

EUGENIA M. HENRY

P. M. MACKLIN

MARY D. THURSTON

The Library building is situated on the corner of Main and Downing streets. The Public Opening of the new building was held January 14th, 1904. A full description of the building and of the Proceedings at the Opening will be found in the *Publications of the Clark University Library* for April, 1904 (Vol. 1, No. 3).

The College Library and study rooms are located in the rooms formerly occupied by the University Library in the Main Building.

The Library contains about 42,000 bound volumes and 1,500 pamphlets, and the reading-room receives over 200 journals.

The books are grouped as follows:

| | | | |
|-----|---|---|-----------------------------------|
| A | WORKS OF GENERAL REF- ERENCE | L | BIOGRAPHY |
| B | JOURNALS | M | ANTHROPOLOGY |
| C | MATHEMATICS | N | EDUCATION |
| C D | MATH.-PHYSICS | O | GENERAL SCIENCE |
| D | PHYSICS | P | HISTORY |
| E | CHEMISTRY | Q | LAW |
| F | BIOLOGY, ZOOLOGY, BOT- ANY, PHYSIOLOGY, NEU- ROLOGY | R | POLITICAL AND SOCIAL SCI- ENCE |
| G | GEOGRAPHY | S | ENGLISH |
| H | PATHOLOGY | T | MODERN LANGUAGES |
| I | PSYCHOLOGY | U | CLASSICS |
| J | PHILOSOPHY | W | PRACTICAL ARTS |
| K | RELIGIOUS PSYCHOLOGY | X | LIBRARY SCIENCE |
| | | Y | ART |
| | | Z | MANUSCRIPTS |

Books not included under any of these subjects are grouped as Miscellaneous, and marked according to their case, tier and shelf.

Particular attention is paid to the needs of students engaged in research work. The library already possesses a good collection of complete sets of the best scientific periodicals. It makes liberal purchases for individual needs and supplements these by drawing upon the resources of the older and larger libraries through the inter-library loan system. During the past year 240 volumes were borrowed from, and 162 volumes lent to, other libraries. The number of books added each year is about four thousand volumes.

The publications of the library, edited by the Librarian, and commenced in October, 1903, are as follows:

VOL. 1

- No 1. WILSON, LOUIS N.
Bibliography of the Published Writings of
President G. Stanley Hall. Oct. 1903.
- No. 2. WILSON, LOUIS N.
Bibliography of Child Study for the Year 1902.
Jan. 1904.
- No. 3. Proceedings and Addresses at the Public Open-
ing of the Library Building of Clark University,
Thursday, January 14, 1904. Apr. 1904.
- No. 4. WILSON, LOUIS N.
Bibliography of Child Study for the Year 1903.
July 1904.
- No. 5. WILSON, LOUIS N.
Preparing Manuscript for the Press. Jan. 1905.
- No. 6. Founder's Day, Clark University. Apr. 1905.
- No. 7. WILSON LOUIS N.
Bibliography of Child Study for the Year 1904.
July 1905.
- No. 8. DE PEROTT, JOSEPH
The Probable Source of the Plot of Shake-
speare's Tempest. Oct. 1905.
- No. 9. Proceedings and Addresses at the Public Open-
ing of the Art Department of Clark University.
Dec. 1905.

VOL. 2

- No. 1. List of Books and Pictures in the Clark Me-
morial Collection. July 1906.
- No. 2. WILSON, LOUIS N.
Bibliography of Child Study for the Year 1905.
Oct. 1906.

The department of religious psychology, established within the past two years, has grown rapidly and now supports *The American Journal of Religious Psychology and Education*, of which Volume 2 is nearing completion.

The books in the Art Department are accessible on application to the librarian, but, by the terms of the Founder's will, they cannot be taken from the building.

All the privileges of the library are open to all members of the University, and each member has direct access to every book and journal.

The library is open from 8 A. M. to 6 P. M.

Outside the University are found:

The Library of the American Antiquarian Society, organized in 1812, and containing over 120,000 volumes, is accessible to all members of the University.

The Worcester Public Library, containing 590 newspapers and magazines and 153,000 volumes, has, in the past, to some extent supplemented the scientific publications purchased by the University, and all its privileges are accessible without charge.

The Library of the Worcester District Medical Society of over 10,000 volumes is also free to all members of the University.

LIBRARY RULES

No loud talking is allowed in any part of the Library.

Every book shall be returned at the end of one calendar month from the time at which it was taken out, but may be called in at any time at the discretion of the Librarian.

Current numbers of periodicals shall not be taken out until they have been in the Library ten days.

All dictionaries, cyclopædias, and books of general reference are permanently reserved.

Reserved books and current numbers of periodicals, exempt from circulation, may be taken out after 5.30 P. M., but must be returned before 9 o'clock the next morning, excepting that such books and periodicals may be taken out Saturdays at 12 o'clock M., and may be kept until 9 o'clock the next Monday morning.

Readers must not write or make any mark upon any book, manuscript, map, or other property belonging to the Library.

Any breach of the above Rules will involve suspension of the Library privileges until personally restored by the Librarian. All such cases shall be laid before the Library Committee at their next meeting.

ART DEPARTMENT

In his last will and testament the Founder of the University bequeathed

“the sum of \$100,000 as an endowment fund for the Art Department of said University, and said sum is to be held and kept sacred and intact as a principal not to be used or expended under any conditions, but the income, interest or proceeds thereof shall be used only in putting and keeping said works of art or others given or obtained for said department in good condition and in taking care of them; and then if there is a surplus of the income of said fund left, I will and direct that it be used in the purchase of additional works of art or of such matters as will add to the usefulness and efficiency of said Art Department.”

Under these conditions a large room has been furnished and equipped on the upper floor of the Library Building. Upon the death of Mrs. Clark, those of the Founder's collections that were deemed most suitable for this purpose were arranged and displayed in this room, together with his most valuable books, which, by the conditions of the will, cannot be removed from the building. A complete catalogue of these books and paintings has been published in the PUBLICATIONS OF THE LIBRARY, Vol. 2, No. 1. A Curator and Custodian of them have been appointed by the Board (see page 89) and all are now accessible to visitors. The Art Department is open daily (except Sundays) from 9 A. M. to 5 P. M.

REGULATIONS

1. All requisitions for apparatus must be made through the Bursar's office upon printed blanks provided for that purpose, and signed by a member of the staff.

2. So far as possible, orders for only the kind and amount of apparatus certain to be used during the year shall be placed; nothing shall be ordered for future years, and apparatus for research shall take precedence over that for teaching and illustration only.

3. Requisitions for repairs, furniture, plumbing and work about the buildings must be made through the Bursar's office in writing and with detail, and when once passed upon, no change involving additional expense can be made in the requisition without the consent of the Finance Committee.

4. No unappropriated rooms and no part of the University grounds shall be used for any purpose, and appropriated rooms shall not be used for other purposes than the stated University work for which they were intended without previous permission from the office.

5. Unless for special reasons, absence of instructors from their stated exercises or from town for two consecutive week days, in term time, should be announced at the office, and for longer absence permission should be obtained beforehand.

6. The Trustees desire that no instructor, Docent, or Fellow shall enter upon other engagements outside

his proper work in the University of a kind or amount likely to lessen his full efficiency for science within the University.

7. Appropriations shall hereafter cover all apparatus and supplies of whatever nature for laboratories, for demonstration or illustration; all metal and carpenter work connected with the scientific activity of each department; and every form of special service. Appropriations, however, shall not hereafter cover books or journals, which shall be submitted to the Library Committee.

8. The several appropriations made to individual instructors and others shall be the full and fixed limit of the liability of the University, to be on no account transcended, and for every excess over the appropriations, from whatever cause, the instructor making the order shall be personally responsible.

9. No order for any purpose shall be paid by the University, whether on appropriations or for general supplies, that has not passed through the Bursar's office.

10. The President, Professors, Assistant Professors and regular Instructors authorized by the Board to do graduate work, together with the Librarian, shall constitute the Faculty of the University. Its meetings shall be called and presided over by its President, or, in his absence, by a Professor whom he shall designate. The Faculty shall elect a Secretary and its records shall always be accessible to the Trustees. Its jurisdiction shall include all matters pertaining to the instruction, conduct and discipline of students, and such other duties as may be prescribed by the Trustees.

11. The President of the University shall make at

the October meeting an annual report on the condition of the departments and their work during the year and shall have authority to require and receive from all instructors and officers of the University and Library such reports as he may deem necessary. A copy of these reports, including that of the Library, shall be deposited with the Mayor of the City.

12. The University Faculty shall have the oversight of all graduate work and shall recommend for the Master's, Doctor's and all other graduate degrees upon such terms, conditions, and forms as it may determine, and exercise such other functions and responsibilities as are not expressly assigned to the Trustees or to the Collegiate Department.

13. The Custodian of the Art Collection shall have general oversight over its room in the Library Building and its contents, together with their care and use, under the direction and control of the Curator. The Curator shall from time to time submit to the Trustees his recommendations for the purchase of additional works of art from the income of the Art Fund, based on and together with the opinions of experts as to their value and desirability. All such purchases shall be approved by the Board of Trustees, or by such a committee of their members as they shall appoint for that purpose.

14. The President of the University shall make an annual report to the Trustees of the action of the Library Committee, of which he is Chairman, and this report if approved shall be filed and preserved.

DEGREES CONFERRED

On June 19, 1906, the University conferred degrees upon the following persons:

MASTER OF ARTS

ALBERT H. N. BARON

Dissertation: The treatment of juvenile offenders in Worcester, Massachusetts.

ROBERT IRVING BRAMHALL

Dissertation: 1. The origin and growth of the English manor. 2. The Congo in American diplomacy.

FREDERICK NORTON COOKE, JR.

Dissertation: A study of causes of poverty in Worcester, Massachusetts.

GEORGE LEONARD DROWNE

Dissertation: The essential elements of poetry.

ARTHUR HOWARD ESTABROOK

Dissertation: The present status of the English sparrow problem in America.

BURTON NOBLE GATES

Dissertation: Cellular structures in the peach.

ELMER ADNA HARRINGTON

Dissertation: Quantitative observations on the vibration of a tuning-fork.

WILLIAM HAROLD KEITH

Dissertation: The development of Russia in Asia: its past and future.

CHAUNCEY ALLAN LYFORD

Dissertation: A study of the hydrolytic decomposition products of bovine hæmoglobin.

HARRY SCHÜRMANN

Dissertation: Dramatic characteristics of Richard Wagner's trilogy "Der Ring des Niebelungen."

REGINALD WEBSTER WEBB

Dissertation: The psychological novel.

DOCTOR OF PHILOSOPHY

FRANK KELTON BAILEY

Dissertation: On the latent heat of recalescence in iron and steel.

WILLIAM FREDERICK BOOK

Dissertation: The acquisition of skill in typewriting.

ALVIN BORGQUIST

Dissertation: Crying.

American Journal of Psychology, April, 1906, Vol. 17, pp. 149-205.

ALFRED A. CLEVELAND

Dissertation: The psychology of chess and of learning to play it.

FREDERICK N. DUNCAN

Dissertation: A comparative study of contractile tissue.

ARNOLD LUCIUS GESELL

Dissertation: Jealousy.

American Journal of Psychology, October, 1906, Vol. 17, pp. 437-496.

DAVID GIBBS

Dissertation: The pedagogy of geography.

Pedagogical Seminary, March, 1907, Vol. 14, pp. 39.

ALBERT WELLMAN HITCHCOCK

Dissertation: The psychology of Jesus.

JAMES RALPH JEWELL

Dissertation: Agricultural education.

TOSHI-YASU KUMA

Dissertation: A study of school legislation in the United States.

GEORGE EDMUND MYERS

Dissertation: Moral training in the school.

Pedagogical Seminary, December, 1906, Vol. 13, pp. 409-460.

JAMES P. PORTER

Dissertation: The habits, instincts, and mental powers of spiders, genera argiope and epeira.

American Journal of Psychology, July, 1906, Vol. 17, pp. 306-357.

JAMES THERON ROOD

Dissertation: Quantitative investigations on the transmission of sound by the telephone.

The following gentlemen also have taken the examination for the doctor's degree, but have not yet completed all the formal requirements:

EUGENE W. BOHANNON

A. CASWELL ELLIS

PUBLICATIONS RELATING TO THE UNIVERSITY

A Register and Official Announcement is issued each year in February or March.

In the years 1890, 1891, 1892, and 1893, the annual Report of the President to the Board of Trustees was printed.

A Summer School was held for nine years ending in 1903, and in such years a Summer School Programme was issued.

In July, 1899, the University observed its tenth anniversary, and published the following volume :

Clark University, 1889-1899. Decennial Celebration, 8 x 11 in., pp. 566. Published for the University. Price, \$5.00. Contains the lectures delivered by Professors Picard, Boltzmann, Cajal, Mosso and Forel at the Decennial Celebration, July, 1899; also reports by the heads of departments on their aims and ideals, with a list of past and present members of the University and the titles of their published papers.

JOURNALS CONNECTED UNOFFICIALLY WITH THE DEPARTMENTS

THE AMERICAN JOURNAL OF PSYCHOLOGY. This journal was commenced in November, 1887, and is now edited by G. Stanley Hall, E. C. Sanford, and E. B. Titchener (Cornell University) with the assistance of an international board of co-operators. Each volume contains four numbers—issued in January, April, July

and October, Besides original articles, a considerable portion of its space is devoted to careful digests of the important literature in its field. Price, \$5 per volume; single numbers, \$1.50. Florence Chandler, Publisher, Worcester, Mass.

THE PEDAGOGICAL SEMINARY. This journal was begun in January, 1891, and is edited by the President of the University. It is an international record of educational literature, institutions and progress, and is devoted solely to the highest interest of education in all grades, with digests of important literature of all countries. It is the organ of the Educational Department of the University. Each volume contains four numbers—issued in March, June, September and December. Price, \$5 per volume; single numbers, \$1.50. Florence Chandler, Publisher, Worcester, Mass.

THE AMERICAN JOURNAL OF RELIGIOUS PSYCHOLOGY AND EDUCATION. This journal was begun in May, 1904, and three numbers constitute a volume. It aims to give an account of all the more important books and periodicals in its field, which includes religious education, and prints original articles. Each number contains about 100 pages. Price, \$3.50 per volume, \$1.50 per number. Louis N. Wilson, Publisher, Worcester, Mass.

UNIVERSITY COLORS
EMERALD GREEN AND WHITE

To be worn in the hood as a vertical green
stripe between two white ones.

CLARK UNIVERSITY

WORCESTER, MASSACHUSETTS

Department of Physics

ARTHUR GORDON WEBSTER, PH. D., D. SC., Professor of Physics. A. B., Harvard University, 1885 ; Instructor in Mathematics, Harvard University, 1885-86 ; Parker Fellow, 1886-89 ; Student, Universities of Berlin, Paris, Stockholm, 1886-90 ; Ph. D., Berlin, 1890 ; Docent in Physics, Clark University, 1890-92 ; Assistant Professor, 1892-1900 ; Professor, 1900- ; Professor of Physics, Clark College, 1902-07 ; D. Sc., Tufts College, 1905. Member National Academy of Sciences ; Member American Philosophical Society ; President, 1903-05, American Physical Society ; Resident Fellow of the American Academy of Arts and Sciences ; Fellow, American Association for the Advancement of Science ; Member American Mathematical Society and Deutsche Mathematiker-Vereinigung.

JOHN CHARLES HUBBARD, PH. D., Honorary Fellow in Physics. B. S., University of Colorado, 1901 ; Scholar in Physics, Clark University, and Assistant to Professor Webster, 1901-02 ; Fellow, 1902-04 ; Ph. D., Clark University, 1904 ; Instructor in Physics, Simmons College, 1904-05 ; Assistant Professor of Physics, New York University, 1905-06 ; Assistant Professor of Physics, Clark College, 1906-.

GORDON SCOTT FULCHER, M. S., Research Assistant. B. S., Northwestern University, 1905 ; M. S., 1906 ; Fellow in Physics, *ibid.*, 1905-06.

MILAN RADOVANOVICH, Mechanician.

The facilities without which no graduate department of research in pure and applied physics can be complete are comprised under three heads: first, a systematic course of lectures in theoretical or mathematical physics; second, a laboratory with a sufficient number of rooms for individual work and with a sufficient equipment of apparatus and an instrument shop for the speedy production of whatever may be necessary for the research in hand; third, a library containing the classic works on physics, with full sets of journals by which the history of progress, past and present, may be studied, and kept up to date by the continual purchase of the latest works. In all these directions the facilities offered by this department invite attention.

Among the various lines of investigation now attracting the attention of the physicists the following are pre-eminent in importance. First, the interrelations between the luminiferous ether and ordinary matter, and the modifications necessary to be made in Maxwell's theory in order to explain the known optical and electrical phenomena of bodies in motion, and that aspect of the theory which deals with the properties of the small electric bodies known as electrons. This portion of mathematical physics has hardly begun to appear in university courses in this country. Second, the structure of the atoms of matter, to which the subjects of spectroscopy and the new and fascinating field of radioactivity give the most promising clew. Third, the thermodynamics of radiation in general, which is most intimately connected with the first, and of which a similar remark may be made as to the lack of instruction.

Of branches of applied physics now awaiting the attention of the mathematical physicist may be mentioned meteorology, seismology, and geophysics in general, in all of which the accumulation of experimental data is ahead of the development of theory, to such an extent in meteorology that Professor Arthur Schuster has said that it would be advisable to suspend all meteorological observations for the next ten years, until the theory should have in some degree caught up with the mass of information already accumulated. The theory of meteorology depends on complicated applications of hydrodynamics and thermodynamics, so as to make great demands upon the mathematical physicist, but the field is a rich one to him possessed of the skill to cultivate it. The study of earthquake phenomena is one that is now becoming of great importance in this country, while the investigation of terrestrial magnetism has lately made great advances.

It is almost obvious to the trained investigator that no one can expect to become a physicist of the first rank without a thorough training in mathematical physics, as without that the results of experiment will never be collected into a coherent system worthy the name of an exact science. Furthermore all mathematical physics must rest upon mechanics, the principles of which are of an importance transcending that of any other branch of natural science. It is for this reason that the courses in physics in this department begin with mechanics, and are developed progressively in a systematic manner. They have the advantage of

having been deliberately planned for the needs of students of pure physics, as experience has shown them to be prepared by the various colleges, and of being all delivered by the same person, so that logical consistency and continuity of method are assured. The waste of time often incurred by repetitions of the same subject and of changes of notation by various instructors, frequently met with, is thus totally avoided. Attention is called to the fact that no branch of physics is left unprovided for in the courses of lectures.

In order to meet the convenience of students, and to prevent the necessity of waiting for the logical beginning of the cycle, the regular courses are repeated with a cycle of two years. These embrace the subjects which are indispensable, and the pursuit of them will fit the student to read and study any memoirs on mathematical physics. The courses are so arranged that, although they follow in order, it is possible for a student to begin in either year of the cycle. The regular courses are not marked with a star, and constitute a course of from five to seven hours weekly. The starred courses are delivered at irregular intervals, according to the demands, or the presence of students of sufficient advancement.

LECTURES.

1. DYNAMICS. GENERAL PRINCIPLES, EQUATIONS OF LAGRANGE AND HAMILTON, METHODS OF HAMILTON AND JACOBI, SYSTEMS OF PARTICLES, RIGID BODIES.

This course is fundamental for the pursuit of all the others, and includes a detailed account of the principle of Least Action and the differential equations of Lagrange, preparatory to their application to other parts of mathematical physics such as optics and electricity.

2. NEWTONIAN AND LOGARITHMIC POTENTIAL FUNCTIONS, ATTRACTION OF ELLIPSOIDS.

This course is a necessary preliminary to the study of electricity and magnetism, of hydrodynamics, and of the figure of the earth.

3. ELASTICITY, HYDRODYNAMICS, WAVE AND VORTEX MOTION, DYNAMICAL BASIS OF SOUND AND LIGHT.

This course is the basis of applications to the theory of all wave motion, whether of sound, light, electro-magnetism, or earthquake waves, and to the study of meteorology.

- 3a*. DYNAMICS OF CYCLIC AND OSCILLATORY SYSTEMS, WITH APPLICATIONS TO THE THEORY OF ELECTRICITY, SOUND AND LIGHT.

The substance of the preceding courses is contained in Professor Webster's Treatise on Dynamics. B. G. Teubner, Leipzig.

3b*. THE THEORY OF RESONANCE WITH APPLICATIONS TO THE MEASUREMENT OF SOUND AND TO WIRELESS TELEGRAPHY.

This course takes up Professor Webster's original researches in acoustics, and also shows how the methods there employed bear on the fundamental electrical phenomena involved in wireless telegraphy.

4. ELECTRICITY AND MAGNETISM. THE CLASSICAL THEORIES AND THE THEORY OF MAXWELL, WITH AN ACCOUNT OF THE PRINCIPAL METHODS FOR THE SOLUTION OF PROBLEMS, AND APPLICATIONS TO ABSOLUTE MEASUREMENTS.

The substance of this course is found in Professor Webster's Mathematical Treatise on the Theory of Electricity and Magnetism. London, Macmillan & Co.

4a*. RECENT DEVELOPMENTS IN ELECTRICAL THEORY, INCLUDING THE THEORY OF LORENTZ.

The application to the theory of Electrons, and to the Optics of Bodies in motion.

5. THE THEORY OF LIGHT. PROPAGATION OF LIGHT, DIFFRACTION, REFLECTION AND REFRACTION, DISPERSION, DOUBLE REFRACTION, POLARIZATION, METALLIC REFLECTION, MAGNETO-OPTICS.

5a. COMPARISON OF THEORIES OF THE ETHER.

Critical and historical examination of the various mechanical explanations of the luminiferous ether, including those of Green, McCullagh, Kelvin, Maxwell, Sommerfeld and Larmor.

5b. GEOMETRICAL OPTICS. PROPERTIES OF SYSTEM OF RAYS, AND THEIR VARIOUS ABERRATIONS. HAMILTON'S CHARACTERISTIC FUNCTION OR EKONAL. APPLICATIONS TO OPTICAL INSTRUMENTS.

6. THERMODYNAMICS, THERMO- AND ELECTRO-CHEMISTRY.

The establishment of the two laws of Thermodynamics, and their application, by means of the methods of Gibbs and Helmholtz, to the examination of physical and chemical phenomena. Application to heat-engines, including steam, gas, and oil engines, the flow of gases and vapors, and the steam turbine. The conditions of chemical equilibrium, phenomena of electrolysis, osmotic pressure, and capillarity.

7. THE KINETIC THEORY OF GASES. THE MAXWELL-BOLTZMANN THEOREM AND THE ELEMENTS OF STATISTICAL MECHANICS.

8*. THE THEORY OF RADIATION AND OF A BLACK BODY.

The relations obtained from the Laws of Kirchhoff, Stefan, Wien, and Planck, by the recent application of Thermodynamics.

9*. THE PHENOMENA OF CONDUCTION OF ELECTRICITY IN GASES, AND OF RADIOACTIVITY, AND THEIR BEARING ON THE STRUCTURE OF THE ATOM.

10. THE PARTIAL DIFFERENTIAL EQUATIONS OF MATHEMATICAL PHYSICS.

Laplace's Equation, Equation of Thermal and Electrical conduction, Equation of Wave-motion, Helmholtz's Equation, Beltrami-Lorentz Equation, Telegrapher's Equation, and their special cases; methods of Cauchy,

Green and Riemann; Developments in Series, Fourier's Series, Legendre's, Laplace's, Bessel's and Lamé's functions.

This course is one of the most important for the physicist, and treats a great variety of subjects from the most varied fields, grouping them all into a connected system, and embracing all the methods of theoretical physics.

11*. THE ELEMENTS OF THE SUBJECT OF INTEGRAL EQUATIONS, IN ITS APPLICATION TO MATHEMATICAL PHYSICS.

12*. SELECTED CHAPTERS IN THE APPLICATIONS OF THEORETICAL PHYSICS TO COSMICAL PHENOMENA, INCLUDING PROBLEMS OF GEODESY, THE TIDES, METEOROLOGY, SEISMOLOGY, AND TERRESTRIAL MAGNETISM.

13*. LINEAR DIFFERENTIAL EQUATIONS.

The applications of the theory of functions to the linear differential equations (ordinary) which arise in mathematical physics.

14*. ORTHOGONAL SURFACES AND CURVILINEAR COORDINATES, AND THEIR APPLICATIONS.

In addition to the above formal courses there is held a weekly Colloquium, or meeting for the informal discussion of subjects not treated in the lectures, and for the presentation by the students of reports on important articles appearing in the journals. A part of the work of the colloquium consists in the systematic presentation of certain classical researches, more or less connected with the lectures, in preparing which the students make use of the original sources of information, thus gaining much acquaintance with the methods of the masters in research. The work of the colloquium has an excellent effect in training students to present their ideas in a systematic manner before an auditory.

THE LABORATORY.

The laboratory occupies three floors of one wing of a large building lighted on three sides, free from disturbances, and admirably adapted to the purposes of a physical laboratory. On the ground floor is a room extending across the end of the building, forty-five feet long by twenty-two feet wide, with windows on three sides, above which are three similar rooms. A lift running from the bottom to the top floor affords a means of transporting apparatus, while its shaft furnishes space for manometer or barometer tubes. In the lower room are four piers with heavy stone tops, and two others below the floor on which can be placed heavy tables.

The other rooms on the ground floor are a large dark room, partially below ground, in which the temperature is tolerably constant, containing a very large and heavy pier. The engine and storage-battery room containing a kerosene engine and dynamo

on the same foundation, and sixty storage cells of ten ampères capacity, constitutes the power-supply. The engine may be started at a few moments' notice, even at night. The storage cells are conveniently arranged so that each one is accessible from each side, from above and below, and the ventilation is excellent, while the room is as light and clean as the work-rooms. Distributing switchboards enable the current from the dynamo or any section of the battery to be supplied to any of the rooms. On the same floor are three rooms constituting the workshop, one of the most important parts of a research department of physics. The first room is devoted to wood-working and pattern-making, and accommodates also a bench for soldering. The next room contains the machinist's bench, two engine-lathes, jeweller's lathe, drill-press and planer, and the third room a Rivett precision bench-lathe. There is no countershafting in the building, each tool being driven by a separate electric motor, while the capacity of the battery is such that for ordinary purposes it is not necessary to drive the engine for the shop alone, so that perfect quiet and steadiness are ensured. In the shop are executed all repairs and alterations of apparatus, and in addition is constructed the new apparatus requiring continual experiment. Most of the principal pieces of apparatus belonging to this department have been thus constructed. In this manner, by having a mechanic always present, an extremely great economy in time and money is effected, and vexatious delays, which would otherwise completely arrest the progress of the work, are avoided. Facilities are given to the students, and they are encouraged to construct apparatus for themselves.

On the main floor are the lecture room, the director's office, the large room used as the director's private laboratory and apparatus room, and three other convenient rooms for research. Two of these are arranged so that they may be darkened for photography, and are also fitted with chemical hoods. The large room on the top floor is devoted to the Rowland twenty-foot diffraction grating, and has a photographic dark room attached. Every room in the laboratory contains sinks, gas and electric light connections, and several circuits connecting with the switch-board in the battery-room.

The laboratory is well equipped with apparatus for research, besides having the facilities above described for the construction of instruments of any sort needed for that purpose. In addition may be mentioned a large collection of diagrams illustrative of mathematical physics, many of them being originals of the figures in Professor Webster's "Electricity and Magnetism" and "Dynamics," and a number of interesting models used in teaching dynamics, thermodynamics, and electricity. Among them are Maxwell's Dynamical Top and a number of other interesting tops, Rayleigh's induction model, Gibbs's, van der Waals's and other thermodynamical surfaces. This collection of drawings and models can probably not be matched in this country, and is continually being increased.

The laboratory affords so much space that it is rarely necessary to put more than one student in a single room. Every student receives personal attention in the laboratory from the professor whenever he needs it, and is continually in receipt of instruction and suggestion by personal contact, the best form in which information can be imparted. Emphasis should be laid on the advantage to the research student of the contact with a professor who has no other duties or interests than the furtherance of research, in an institution devoted to this as its main object.

THE LIBRARY.

In the library Clark University has one of its strongest features. A large separate building, administered in the most liberal manner with the view of the advantage of the research student, and with ample funds for the purchase of books, its facilities in the Department of Physics can hardly be surpassed. It may be said to contain all of the most important works in many languages, and is continually kept up to date, any book that may be absent needing only to be mentioned to be procured. The library is particularly rich in journals, among which are included the transactions of the learned societies of England, France, Germany, Italy, Austria, Holland, and Belgium. Other sets are being continually added. There are few subjects connected with physics which may not be thoroughly studied in this library.

SCHOLARSHIPS AND FELLOWSHIPS.

Several scholarships and fellowships are at the disposal of this department. Fellowships bear an income of one or two hundred dollars, in addition to the remission of tuition, and, except in unusual cases, are awarded only to students who have been found worthy by personal observation of a year's work in the department, or who have done an equivalent amount of graduate work in some other university.

In conclusion attention is called to the fact that the demand for instructors in physics is now becoming larger than the supply, and that every person holding the doctor's degree from this department has occupied a college position, while several have become engineers, in connection with wireless telegraph or telephone work, for which their work here has particularly qualified them.

may 9-07

CLARK UNIVERSITY

WORCESTER, MASSACHUSETTS

DEPARTMENT OF PSYCHOLOGY AND EDUCATION

INCLUDING THE HISTORY OF PHILOSOPHY (LOGIC, METAPHYSICS, ÆSTHETICS AND THE PHILOSOPHY OF RELIGION); ANTHROPOLOGY, ESPECIALLY ON ITS PSYCHIC SIDE, INCLUDING MYTH, CUSTOMS, BELIEF, FOLK-LORE, ETC.; NEUROLOGY; PSYCHIATRY, WITH CLINICS AT VARIOUS HOSPITALS FOR THE INSANE AND FOR OTHER DEFECTIVES; AND THEIR RELATED SUBJECTS, AS SHOWN BELOW.

PERSONNEL

G. STANLEY HALL, PH. D., LL. D., President of the University and Professor of Psychology, A. B., Williams College, 1867; A. M., 1870; Ph. D., Harvard University, 1878; Lecturer in Harvard and Williams Colleges, 1880-81; Professor of Psychology, Johns Hopkins University, 1881-88; LL. D., University of Michigan, 1888; Williams College, 1889, and Johns Hopkins University, 1902; Curator of the Art Collection, Clark University, Resident member of the Massachusetts Historical Society.

EDMUND C. SANFORD, PH. D., Professor of Experimental and Comparative Psychology, A. B., University of California, 1883; Fellow, Johns Hopkins University, 1887; Ph. D., Johns Hopkins University, 1888; Instructor in Psychology, Johns Hopkins University, 1888; Instructor in Psychology, Clark University, 1889-92; Assistant Professor, 1892-1900; Professor of Psychology, Clark College, 1903-1907.

CLIFTON F. HODGE, PH. D., Professor of Biology, A. B., Ripon College, 1882; Fellow in Biology, Johns Hopkins University, 1888-89; Ph. D., Johns Hopkins University, 1889; Fellow in Psychology and Assistant in Neurology, Clark University, 1889-91; Instructor in Biology, University of Wisconsin, 1891-92; Assistant Professor of Physiology and Neurology, Clark University, 1891-1906; Professor of Biology, Clark College, 1902- . (See special circular for Biology).

WILLIAM H. BURNHAM, PH. D., Professor of Pedagogy, A. B., Harvard University, 1882; Instructor in Wittenberg College, 1882-83; Instructor, State Normal School, Potsdam, N. Y., 1883-85; Fellow, Johns Hopkins University, 1885-86; Ph. D., 1888, and Instructor in Psychology, 1888-89; Docent in Pedagogy, Clark University, 1890-92; Instructor, 1892-1900; Assistant Professor, 1900-1906.

ALEXANDER F. CHAMBERLAIN, PH. D., Assistant Professor of Anthropology, B. A. (1886), M. A. (1889), University of Toronto; Fellow in Modern Languages, University College, Toronto, 1887-90; Librarian, Canadian Institute, Toronto, 1889-90; Fellow in Anthropology, Clark University, 1890-92; Ph. D., Clark University, 1892; Lecturer in Anthropology, Clark University, 1892-1900; Acting Assistant Professor, 1900-04; Associate Editor, *American Antiquarian*; Editor, *Journal of American Folk-Lore*; Corresponding Member, O Instituto de Coimbra, Portugal; Member of the American Antiquarian Society; Honorary Member of the American Folk-Lore Society.

LOUIS N. WILSON, LITT. D., Librarian of the University and Custodian of the Art Collection, A. B., Clark University, 1905; Litt. D., Tufts College, 1905.

EDWARD COWLES, M. D., LL. D., Non-Resident Lecturer in Psychiatry, A. B., Dartmouth College, 1859; A. M., 1863; Medical House Pupil, Retreat for the Insane, Hartford, Conn., 1860-62; M. D., Dartmouth Medical School, 1863; M. D., College of Physicians and Surgeons, New York, 1863; Medical Corps, United States Army, 1863-72; Resident Physician and Superintendant, Boston City Hospital, 1872-79; Medical Superintendent, McLean Hospital, Waverley, Mass., 1879-1903; Lecturer on Mental Diseases, Dartmouth Medical School, 1885-86; Professor of Mental Diseases, *ibid.*, 1886-; Fellow by Courtesy, Johns Hopkins University, 1887-88; Clinical Instructor in Mental Diseases, Harvard Medical School, 1888-; LL. D., Dartmouth College 1890.

THEODATE L. SMITH, PH. D., Research Assistant to President Hall, A. B., Smith College, 1882; A. M., 1884; Yale University, 1893-95; Special Student, Clark University, 1895-96; Ph. D., Yale University, 1896; Cornell University, 1900; Assistant to President Hall in research work under Carnegie Grant, Clark University, 1902-04; Estabook Grant, October 1904-February 1905; Berlin University, April-August, 1905.

FRED KUHLMANN, PH. D., Grand Island, Neb., Research Assistant to Professor Sanford, A. B., University of Nebraska, 1899; A. M., 1901; Scholar and Assistant in Psychology, *ibid.*, 1899-1900; Fellow and Assistant, 1900-01; Fellow in Psychology, Clark University, 1901-02; Fellow and Assistant, 1902-03; Ph. D., Clark University, 1903; Honorary Fellow and Assistant, 1903-05; Assistant in Psychology, University of Wisconsin, 1905-06.

COLLEGIATE DEPARTMENT

RUFUS CLARENCE BENTLEY, A. M., Collegiate Professor of Pedagogy, in charge of collegiate instruction in logic, ethics, and the history of philosophy, A. B., 1894, A. M., 1896, University of Nebraska; Assistant in Psychology, University of Nebraska, 1893-6; Principal of Schools, Shelton, Nebraska, 1896-7; Principal of High School, Martinez, California, 1897-8; Principal of High School and Supervising Principal of Schools, San Rafael, California, 1898-1900; Fellow in Education, Teachers College, Columbia University, 1900-1; Fellow in Pedagogy, Clark University, 1901-3; Dean, Clark College, 1902-; Professor of Latin, 1902-4; Professor of Pedagogy, 1904- .

JAMES P. PORTER, PH. D., Collegiate Professor of Psychology, A. B., Indiana University, 1898; A. M., 1901; Ph. D., Clark University, 1906; Student, Indiana State Normal School, 1890-1, 1892-3; Teacher, Veedersburg (Ind.) High School, 1893-4; Principal, Kentland (Ind.) High School, 1895-7; Teacher of Science, Streator (Ill.) High School, 1898-1900; Instructor in Psychology, Indiana University, 1900-3; in charge of work in Neurology, Indiana University Biological Station, 1901 and 1903; Honorary Fellow in Psychology, Clark University, 1903-7; Instructor in Psychology, Clark College, 1903-07 .

PLAN AND PURPOSE OF THE COURSES.

The work represented by the different instructors and departments is primarily designed to give the student a knowledge of man and of human nature, of soul and body, as they have been regarded by the great men of the past and from the standpoint of modern science; to show the development and action of psychic faculties in animals, children, savages, defectives and the insane; to give a good knowledge of the anatomy and physiology of the senses and the brain; to introduce the student to the psychological laboratory; to give him a theoretical foundation in ethics, logic, æsthetics, metaphysics and religious psychology; and lastly, to apply all this to education and to life. It is believed both these courses and their combinations are unique and worthy the careful examination of every intending student in any of these fields.

There are no entrance examinations, but the courses are open to all who have attained the Bachelor's Degree or what is judged to be its equivalent, or who are able to profit fully by the work.

Two degrees are given; that of Master of Arts, usually after one year's study, and that of Doctor of Philosophy after two or usually three years' graduate study.

Most who have taken these courses in the past did so with the intention of preparing themselves for professorships in the general field as outlined, or in some part of it, in colleges, or in normal schools, or else to qualify themselves for the higher positions of school principals, superintendents, etc. The list of such positions filled by those who have studied here is a long and honorable one.

In this department and as an index of its activity, three journals are published:

The American Journal of Psychology, edited by Drs. Hall, Sanford, and Prof. Titchener, of Cornell University, now in its eighteenth volume (a quarterly, circa 600 pages).

The Pedagogical Seminary, edited by Drs. Hall, Burnham and others, now in its fourteenth volume (a quarterly, circa 600 pages a year).

The Journal of Religious Psychology, with a monograph supplement, now in its third volume (circa 350 pages).

The Journal of American Folk-lore, published for the American Folk-lore Society, is edited by Dr. Chamberlain in the Anthropological Department.

The first three journals afford opportunity for prompt and gratuitous publication of original work done in the department and this enables each student who achieves something to submit it promptly to the judgment of those competent and interested elsewhere, for all these journals have a large and established circulation among experts in this country and abroad.

The Library, which expends some \$23,000 a year, enables each of the different instructors to obtain promptly the important new publications, and club functions, the review departments, and the custom of exposing all new books for a week on the library tables brings them promptly before the students.

The plan of the University is to conduct its work for relatively few students who can thus be given a great deal of individual attention and helped on in their work personally by the instructors.

The University provides liberal scholarships and junior and senior fellowships, the latter of which pay \$300, to quite a number of students each year who must apply during the spring or summer. Besides this, the tuition fee of \$100 is often remitted, if necessary, and everything possible is done to encourage and assist deserving men.

I.

DR. G. STANLEY HALL gives the following courses:

I. *The History of Philosophy*, beginning with Ancient Greece and ending with the present time, a course usually involving three years with some conference and seminary work and the reading of representative paragraphs or chapters from important writers and often with intensive work on one, most often Plato, Aristotle, Kant, Hegel or Schopenhauer. This course is treated broadly so as to include a brief survey of the development of logic, metaphysics, and æsthetics with a glimpse at the development of theology, medicine and law and with a bird's-eye-view of the developmental history of the sciences. In this course Dr. Hall's first experience and teaching in this field originally centered. The purpose of the course is, while outlining epistemology not to unduly emphasize its subtleties, but to treat the subject rather from the culture history standpoint and regard the systems as human psychological documents, that often need more modern interpretation, and as shedding light on the natural history of man. For these courses a reading knowledge of Greek, Latin or even German or French is not indispensable. While this course is not extensive and detailed enough to be accepted, save in rare cases, as a major for the Doctor's Degree, it is earnestly recommended for every student in this field because it is thought that these subjects have very high culture value. It is permitted for a minor.

II. *Genetic History of the Race and the Child.*

In this course Dr. Hall surveys the results of both paleontology and archæology, outlining the progressive development of life in the different geological eras with considerable detail from the Mid-tertiary through the Glacial Era and that of paleolithic and neolithic man with their occupations, and development through the Stone, Bronze and Iron Ages. This is done as a background for the developmental study of instinct in animals and especially for the psychic evolution of childhood. Here he attempts to sum up all the important work that has been done in the study of children, their growth, motor development, evolution of speech, plays, games and child life generally, together with its diseases and hygiene, its faults, vices and crimes and their treatment, together with the bearings of all these topics upon physical, moral, intellect-

ual and industrial education. In this course, Dr. Hall does not use his two volumes upon "Adolescence," but confines the work to the ages that precede.

The facilities for child study, which almost began at Clark University, in its various aspects are unique here. The Library attempts to collect all important material and publishes annually a descriptive bibliography of the subject. Dr. Chamberlain has published, and lectures upon various aspects of this theme, and publications of work done at Clark upon this subject now aggregate several hundred titles, which can be sent upon application.

For other special, helpful, and individual work done in this domain see below the work of Dr. Smith.

III. *Religious Psychology.*

In this field Dr. Hall gives two courses.

1. On the *philosophy of religion*, based upon a comparative study of the great ethnic religions and upon the lowest forms of fetichism and nature worship. With the latter, the course begins, outlining the present theories of myth, rite, cult, morbid and abnormal, characterizing the primitive worship of various natural objects, sun, moon, stars, clouds, water, trees, fire, animals, etc. The course then characterizes the great religions; Confucianism, Brahmanism, Buddhism, Mohammedanism, Sufism, Zoroasterism and finally the religion of the Old Testament.

2. The second course is on the *Psychology of Jesus and Christianity* and seeks, from a new psychological point of view, believed to be as important and characteristic of future studies in this field as the higher criticism has been in the recent past, to explain the development of the consciousness of Jesus, the main events of his life, together with their meaning, his teaching and the significance of his birth, miracles, death and resurrection finally to analyze his and especially the Christian consciousness in its various experiences, treating the psychology of such topics as faith, prayer, the supernatural, revelation, the psychic value of miracles and especially the psychology of sin and its cure. The course also includes an account of the valuable but interesting very recent literature on the abnormalities of religious experience. This work is in a sense supported and assisted by the *Journal of Religious Psychology*, and is believed to indicate the most important new line of departure in the study of religion.

IV. Dr. Hall also gives two courses in education as follows :

1. The *history of education* from ancient times to the present, including the development of higher as well as elementary institutions and methods, and bringing everything down to the present day, characterizing the recent tendencies in the leading European countries and in our own, with copious literary references.

2. The other course takes up the topics of school work and discusses the methods in each with very copious illustrative material in the way of maps, charts, books, diagrams, material from the Pedagogical Museum, etc.

These courses are always placed at hours when teachers in actual service in Worcester and vicinity can attend, and they always have availed themselves of this opportunity. Both these educational courses are meant to be eminently practical. Work in these departments is in a sense supported and reinforced by the *Pedagogical Seminary*.

V. *Special Topics in Psychology.*

Dr. Hall usually offers each year some rather special course in scientific psychology, the last being upon *the sense of touch*. Another such course is *the psychology of feeling* from the point of view of physiology and genesis. Another is upon the *psychology of sex and reproduction*; another upon *animal psychology* and another upon *insanity*, with special reference to borderline phenomena, treated from a functional rather than the somatic standpoint. Still other of these courses are upon primitive races the psychology of speech, etc.

Ever since the opening of Clark University Dr. Hall has held a seminary three hours a week at his home for the discussion of any or all of the above topics, reading, criticism, and for social enjoyment. He also invites all students to call upon him any afternoon from two to half past four for conference upon any topic, either personal or connected with their studies. Most students who come here desiring to work in close connection with Dr. Hall or under his personal guidance and direction, usually find some special topic in which they have a paramount interest and to which they desire to devote a portion of their time, whether they are making a Doctor's thesis of it or not. This degree of

specialization should not be carried too far, but a little of it is believed to be very essential in the higher education of to-day because it enables a young man to be an authority upon some topic and to have a personal opinion and not be an echo, and this culmination of his individuality makes him more ready to learn of others and in other departments, and the experience of having mastered some topic and appealed in print to the consensus of the competent, marks an era of great interest and value in the lives of many a young scholar. Hence, Dr. Hall encourages this practice and not only his own time is given very freely to such personal aid as is necessary in starting individuals in a course of independent and original thinking, but Dr. Smith devotes much of her time, energy and experience to this work.

Early in the history of Clark University the nucleus of a Pedagogical Museum was formed, and for a full catalogue of what was then in its possession see *Pedagogical Seminary* Vol. I, No. 3. Since then the development of the library side of the museum has been considerably increased and the material, although not formally organized and installed in a definite locality, has increased and is now of great service in the work of instruction in the pedagogical department.

II.

EXPERIMENTAL AND COMPARATIVE PSYCHOLOGY

PROFESSOR EDMUND C. SANFORD

The field of Psychology is the mental life in its full range and variety. The business of the Psychologist is the discovery and clear statement of the laws of that life. In such an undertaking he has need of all the methods and aids which the accumulated skill and experience of workers in his own and other fields have brought together, and of these there are two that have proved themselves in the fields of the physical and biological sciences of sovereign power: the experimental and the comparative methods—the observation of concrete facts under controlled conditions, and the study of similar phenomena in related forms of life. It is for this reason, as well as for the results already attained, that the modern psychologist looks upon the studies of the laboratory and those made in a similar spirit upon animals, children, defectives and the insane as the solid foundation of his

science, and urges the application in all cases of methods of observation as exact as the case will admit. It is for the study of the normal mental life of man and the animals by these methods that the Department of Experimental and Comparative Psychology at Clark is organized. In this study it aims at the furtherance of science and training of students.

The *Methods of Instruction* have varied somewhat from year to year, but have always included lectures, laboratory work, and frequent informal conferences of instructor and student. As at present planned, the chief lecture courses will be repeated in a two year cycle, dealing one year with Experimental Psychology, including the physiology of the nervous system and the sense organs, and the next with Comparative Psychology, including an outline of the general theory of evolution and its application to mental development in the animal series and in man. In addition to these principal courses one or more special lecture courses will be given from year to year upon topics such as the following:

1. The Psychology of Language (based upon the first two volumes of Wundt's *Völkerpsychologie*).
2. Mathematics in its Application to Psychology, including so much of calculus and other mathematical topics as is regarded as essential to an intelligent use of the Psychophysics Methods and the calculation of correlations.
3. Psychological Theory and its Fundamental Assumptions.
4. The Teaching of Psychology, its aims, methods, courses and apparatus, with concrete illustrations.

During the past year Dr. Kuhlmann, the assistant in the department, has delivered a course of eleven lectures on The Psychology of Memory, and similar brief courses by competent lecturers may be expected from year to year.

By the courtesy of professors of Psychology in other institutions, in agreeing to an exchange of lectures, the students of the department have already had this year the advantage of single lectures by Professors Dodge of Wesleyan, Delabarre of Brown, Pierce of Smith, Holt of Harvard and Professor Mary Whiton Calkins of Wellesley. It is hoped that such exchanges may be continued in the future.

The *Psychological Laboratory* consists of a suite of twelve rooms on the upper floor of the main building of the University so

situated as to be fairly quiet and with exposure on three sides of the building. These rooms are at present used for the following purposes: 1. Departmental library and seminary room; 2. Lecture room; 3 and 4, Rooms for special research; 5. Office of the head of the department; 6. Apparatus room; 7, 8 and 9, Rooms for special research or practice work; 10. Shop; 11. Photographic dark-room; 12. Large room for Animal Psychology.

The laboratory is well equipped with apparatus for demonstration and research, and has a yearly appropriation sufficient to insure regular growth and the purchase or manufacture of all the apparatus needed for special investigations. An electric supply ample for the purposes of light and power is now at hand, and increased facilities for its convenient use will soon be added. The shop is supplied with tools for work in wood and metal, and much of the preliminary work upon new apparatus and urgent repairs upon old can be executed in it. It will also be open to any students who would like to increase their skill on this side of laboratory technique. Animals are not kept in stock for work in Comparative Psychology, but are provided as required, together with whatever may be needed for their care and observation.

The laboratory courses include both practice work and original investigation; the first intended to give the student familiarity with psychological experimentation and facility in the handling of apparatus, and the second to introduce him to methods of investigation by intensive study of one or more selected topics carried out under the immediate guidance of the head of the department, the aim being that each problem undertaken shall, so far as possible, fit the interests of the student and result in a contribution of genuine scientific quality, however small in amount. For work of this character no difficulty in publication is found.

The practice course is repeated yearly under the direction of a competent assistant. The research courses vary from year to year and from student to student. Something of the scope and accomplishment in this last direction can be seen in the following partial list of papers published in the *American Journal of Psychology* by students in the department during the last few years.

Kinnaman: Mental Life of two *Maccaus Rhesus* Monkeys in Captivity.

Sears: A Contribution to the Psychology of Rhythm.

- Swift: Studies in the Psychology and Physiology of Learning.
- Kuhlmann: Experimental Studies in Mental Deficiency; Three Cases of Imbecility (Mongolian); and Six Cases of Feeble-mindedness.
- Arnett: Counting and Adding.
- Brown: The Psychology of the Simple Arithmetical Processes.
- Gesell: Accuracy of Handwriting, as Related to School Intelligence.
- Porter: Further Study of the English Sparrow and Other Birds.
- Porter: The Habits, Instincts and Mental Powers of Spiders.

In addition to these may be mentioned the following among researches not yet published or still in progress:

- Book: The Psychology of the Learning of Type-writing.
- Cleveland: The Psychology of Chess and Chess-playing.
- Gard: A Study of the Elementary Processes in Reasoning.
- Davis: The Habits and Mental Life of the Raccoon.

The collection of *Psychological Books* in the University Library is large and well selected and is receiving constant additions, while the collections in the related fields of biology, physiology, neurology, anthropology, philosophy and education enable the student to follow collateral lines with ease. The library is especially strong in current scientific periodicals and has also complete sets of the proceedings of many of the learned societies. The comparatively small number of graduate students allows great freedom in the use of the books, and the liberal policy and endowment of the library makes it possible to supply practically everything needed, by purchase if the book is easily to be had, or by borrowing in the case of rare and uncommonly expensive works. The policy has always been to procure for every man everything necessary for the prosecution of research.

ANNOUNCEMENTS FOR 1907-1908

LECTURES.

1. *Comparative Psychology and Psychogenesis.* Review of the General Doctrine of Evolution as a basis for the more detailed study of the Evolution of Mind. Review of Experimental and Observational Studies upon typical forms of Animal Life beginning with the protozoa. Animal and Human Infancy. Selected

Aspects of Social Evolution. (Course given by Dr. Sanford, not less than three hours weekly throughout the year.)

2. *Mathematics in its Applications to Psychology*, including so much of calculus and other mathematical topics as is judged essential to the intelligent management of the Psychophysical Methods and the simpler calculations of correlation. This course will be given in informal conferences with an abundance of practice in the making of the calculations considered. (Course given by Dr. Sanford, two hours weekly, first semester.)

3. *Psychology for Teachers and the Teaching of Psychology*. This will be an elementary course, outlining briefly and somewhat rapidly the main features of the science and following closely the plan for a beginner's course sketched in a late number of the *Pedagogical Seminary*. All matters treated will be made as concrete as possible by means of experiments, charts and other illustrative material; and the aim will be in general to present the several topics in such a way as to make the course helpful alike to teachers desiring an introduction to the subject and to those among the University students who may be called upon at some time to give elementary courses in psychology. (Course to be given by Dr. Sanford, Saturday mornings throughout the year.)

LABORATORY.

4. *Laboratory Practice Course*. (Course given by a qualified assistant under the general supervision of Dr. Sanford, four to six hours in the afternoon, weekly throughout the year.)

5. *Research Laboratory Course*. (Courses given by Dr. Sanford, at times convenient to the instructor and those taking the work.)

JOURNAL CLUB.

6. A *Journal Club* for the reading and discussion of current Psychological Literature will probably be organized also; and if desired opportunity will be offered for the reading of standard psychological texts in German.

III.

ANTHROPOLOGY

Dr. Chamberlain's courses in Anthropology are intended to bear more or less upon those offered in Psychology and Educa-

tion, especially in relation to "Child Study" and the evolutionary parallelisms between the child and the race, etc. Besides the general course, which embraces the principal features of the science (Physical Anthropology, Ethnography, Ethnology, Sociology, Linguistics, Criminal and Pathological Anthropology, Prehistory and Archæology), there will be arranged for those students desirous of taking up Anthropology as their main subject of research a special course covering the details and particulars of the science.

The nature of the other courses offered is indicated in the outlines given below.

I. *Primitive Man.* "Primitive" traits and their significance. Physical, psychical and other characteristics of the earliest men and their modern representatives. The mind of primitive man and its expressions in language, institutions, customs and habits, arts and industries, religion, philosophy, science, etc. The individual in primitive culture. Primitive character-types. Primitive man and civilized man, their relations, resemblances and differences. Study of more or less typical primitive peoples in America, Africa, Asia, Indonesia, etc.,—particularly, and in detail, the Veddas of Ceylon, the Toala of Celebes, the Ainu of Yesso, the Negritos of the Philippines, the primitive races of India, the African pigmies and more primitive Negro tribes, the Seri Indians of the Gulf of California, the Eskimo, the more primitive tribes of South America, etc. Special topics considered in detail: The primitive mind in the presence of civilization; primitive survivals in modern culture; modern recruitings of strength from primitive sources; "back to the human." Progress and its criteria; theories of "decadence" and "degeneracy;" the transient and the permanent in human evolution. The evolution of human institutions, family, school, church,—their primitive forms and prototypes. Primitive arts and industries and their modifications by "higher" races. Relation of "highly gifted races" such as the ancient Greeks, etc., to primitive man; evidence that these "great races" were more beautifiers, harmonizers and idealizers of material adopted from primitive man than creators of new things out of hand or of new ideas. The so-called "epochs" and "stages" in the evolution of primitive man; the question of chronology in the growth of human arts and institutions. The religion of primitive man; significance of such theories as "animism," "ancestor

worship," "fetishism," etc.; the interpretation of mythology and folk-lore. The psychology of primitive languages, with particular reference to those of aboriginal America. Primitive morals and ethics; the ethnology of the virtues and the vices. The meaning of civilization.

II. *Race in human history, individual and social.* Origin and development of the races of mankind, their characteristics and their rôle in the evolution of culture. Race in relation to the precursors of man. The racial aspect of the prehistoric world. Extinct human races and the causes of their disappearance. Survivals of ancient races. Modern and "new" races. "Progressive" and "unprogressive" races. The unprogressive white races. "Higher" and "lower" races. Race-mixture, past, present and future. "Race-areas" and "race-culture." The chief human races ("white," "black," "red," "yellow," "brown," etc.), and their contributions to the achievements, material and spiritual, of mankind. Special topics considered in detail: "Race-prejudice." The relations of the so-called "higher" and "lower" races, the phenomena involved in ancient and modern "imperialism," "benevolent assimilation," and other forms of race-domination and race-subjugation; the anthropological solutions of such problems. The history of the Mediterranean peoples from the point of view of anthropology; the story of the development of civilization through race contact. The Orient and the Occident in their relations to human evolution; China, Japan, India, Russia, in their racial aspects, ancient and modern. The European origin of the Aryans and its significance for human history; the prehistoric culture-rôle of Europe. The Negro in Africa and America; the relation of the black race to the future development of mankind; not a degenerate race, but a human race, like the others. The American Indian and his contributions to the civilization of mankind; marked example of the achievements of one race. The anthropological history of America, from prehistoric times down to the present; the problems of race mixture in the New World; the higher human significance of the mingling of races; the great unity of the future. The share of the individual and the race in the final expression of human civilization.

From time to time brief courses are offered upon topics directly connected with the study of childhood. During the next

year, if the interest in the subject justifies it, such a course will be given on "Child-Language and Primitive Speech."

During the past year many important volumes have been added to the Anthropological Department of the Library, which now contains a large and increasing number of books and monographs relating in particular to primitive peoples, affording excellent facilities for investigation in the literature of this subject. Full sets of the chief anthropological periodicals are also in the Library and easily accessible.

IV.

PEDAGOGY

The aim of the department is twofold: First, to give instruction and training to those who are preparing to be professors of pedagogy, superintendents, or teachers in higher institutions. Second, to make scientific contributions to education. These two ends are so closely related that the pursuit of one involves much of the work required for the other also. As a matter of fact those who, as students in this university, have engaged in research work in education and psychology are now holding important positions in universities and normal schools scattered all over the country from Worcester to the Pacific Coast.

Thus the department in a large degree does a work similar to that of the *École normale primaire supérieure* at St. Cloud, in France, combined with that of the *École normale supérieure* at Paris. So far as special pedagogical training is concerned, the work, although more advanced, is similar in a way to that at St. Cloud, which prepares teachers who are in turn to become teachers in the provincial normal schools scattered through France. So far as research is concerned, the work is more like that of the *École normale* in Paris which trains a select body of students who are preparing to become professors in the *Lycées* or the universities of France. The whole work of the department is closely related to that in psychology, and no strict line of division between the two is made. Pedagogy is based on psychology, and psychology in turn has in recent years found some of its most fruitful subjects for research in the pedagogical field. Students of pedagogy cannot dispense with a fundamental knowledge of psychology,

and students of psychology in turn cannot wisely close their eyes to the wider educational aspects of their subject.

Suitable preparation for the course involves so much of general education as is usually indicated by the B. A. degree. A good reading knowledge of French and German is important; and an acquaintance with elementary science, especially elementary psychology, is desirable. The course extends over three years.

The following courses are given by Dr. Burnham:

SCHOOL HYGIENE.

The field of school hygiene has been enormously enlarged during recent years and a vast and important literature on this subject has appeared. It is no longer concerned merely with the sanitation of schoolhouses and their surroundings, but with the total physical condition of the school child; it demands that the conditions of school life shall foster healthful development, and it studies every pedagogical principle and method and the material of instruction in every school subject with regard to the development of healthful habits.

Three courses in this subject are given. 1. A course on the schoolhouse and its equipment, heating, lighting, ventilation, furniture, etc. 2. On the hygiene of instruction considering the principles of mental hygiene and the hygienic aspect of each of the school subjects together with a discussion of subjects connected with the period of study, vacations, length of study periods, recesses, etc. 3. On the hygiene of the school child. The first two of these courses are omitted in 1907-08. The last, on the Hygiene of the School Child, is given.

This course includes such topics as: The conditions that determine growth and development. The adaptation of education to physiological age. The general principles of somatic and mental hygiene. The hygiene of the senses. Modern studies of defects of sight and hearing. School diseases. The hygiene of the voice, the mouth, the teeth, and the nose. Mental diseases and faults of children. Neuroses of development. Tests of ability to work and of physical condition. Medical inspection. The hygiene of discipline. The development of habits of healthful mental activity. The hygiene of memory, of attention, and of feeling. Once a week, Saturdays, throughout the year.

EXPERIMENTAL PEDAGOGY.

The experimental method has long been used in School Hygiene. In recent years this method has been extended to other branches of pedagogy. The advocates of this method in Germany, men like Lay, Kemsies, Meumann, and his pupils, have made important contributions by the investigation of such strictly educational questions as home study, the difference between the results of pupils studying in groups and as individuals, economical methods of memorizing, etc. Tests of individual condition and ability have been devised and many experimental studies of the methods in different subjects of school instruction, reading, writing, spelling, and arithmetic have been made.

Hitherto, as pointed out by advocates of experimental pedagogy, there has been great confusion of opinion in regard to educational questions. Every educator presents his own view and is likely to set up his own method as a panacea for pedagogical ills; individual differences in children are ignored; every one is right in part because he sees a part of the truth; every one is likely to be wrong because he does not see the whole truth. No universal principles can be established because there is no scientific basis for pedagogical doctrines. The teachings of the different pedagogical schools are apt to be based upon the opinions of one master or gained by the pooling of opinion based upon desultory observation. Thus it has come to pass that, as regards large parts of the field of education, the words of Stimpfl are true, that pedagogy to-day is in much the same condition as physics was at the time of Galileo.

Experimental pedagogy does not expect to settle all educational questions at once, but attempts to supplement observation and the experience of the past by the study of concrete educational questions by the experimental method. The great advantage of this is that it enables one to come to close contact with all the factors involved in an educational problem. And where the result of experiment is merely to corroborate ordinary observation in the schoolroom, nevertheless it often makes concrete, definite, and tangible what were before mere platitudes of experience. And, finally, perhaps most important of all, it develops the right attitude in the student of educational problems,—the objective scientific attitude rather than that of dogmatic opinion. In a word, the

scientific experimental attitude is an attempt to study objectively all the facts involved in an educational question.

The course for 1907-08 will be an introduction to this subject and include such topics as the following: A résumé of important results of recent experimental studies. The general point of view of experimental pedagogy. The contribution of experimental psychology to pedagogy. Experiments on the learning process, the acquisition of motor habits, the acquisition of technical skill, telegraphy, piano-playing, etc. Experimental studies of memory and of testimony. Experimental studies in reading, arithmetic, and writing, etc. Tests of intelligence. The significance and value of experimental studies in pedagogy. Practical results. In general the attempt is made to present important results obtained in each subject by experimental studies in the United States and in Europe together with a bibliography of important literature.

One hour a week, half a year.

PRINCIPLES OF EDUCATION.

This course treats certain fundamental educational principles and involves also a study of several important chapters in the history of education, with a brief account of a few representative educational systems. Such topics as the following are included: Educational ideals. The dominant aim at different stages of development. The correlation of educational forces. The family and education. The church and education. State aid and control. The field of scientific study in education. Antithetic educational principles. The history of nature versus convention in education. Rousseau. Pestalozzi as "pedagogical socialist." Modern Sozialpädagogik. Present problems and tendencies. One hour a week, half a year. Given in 1907-08.

HISTORY OF EDUCATION

In this course the attempt is made to suggest a broader study of the history of education than that usually employed. The development of education is a part of the development of civilization in general, and the history of education is a part of Culturgeschichte. Educational movements should be studied in their genesis and in their relation to contemporary industrial, social, political,

and ecclesiastical movements, as well as in relation to the general intellectual movements of the time; and educational writers, so called, are not the only ones who have contributed to the history of education. In this course the attempt is made to note some of these wider relations and to see the narrower educational history somewhat in perspective. The course involves especially the study of the modern educational movements begun at the renaissance and developed by Comenius, Rousseau, Pestalozzi, and their followers. Such topics as the following are studied: the influence of these reformers on educational ideals, methods, the organization of schools, and the relation of educational movements to political and social movements. The disciples and opponents of these reformers. Nature and convention. Realism and Neo-humanism. Present problems and tendencies. Once a week, half a year.

The Organization of Schools in Europe. The systems of England, France, and Germany. The genesis of the school systems and the wider social, political, and industrial relations of education. Primary, secondary, and higher education. Educational ideals. Recent movements. Educational literature. One hour a week, half a year.

THE EVOLUTION OF THE TEACHING PROFESSION

In this course the attempt is made to trace the evolution of the teaching profession. This brings one to certain pressing, practical, educational questions of to-day in regard to teachers, and shows these problems in historical perspective. For example, the questions of the pay of teachers, the social and political significance of the teachers' function, the professional training of teachers, the question of men and women teachers, the questions of organization and segregation, and of the autonomy of the profession as regards matters relating to the schools, the problem of the relation of the teacher to the school as a social group—the great question involved in such movements as that of the school city of to-day. Such study of the development of the teaching profession has not hitherto been carried far, but it is of prime importance in showing the social function of the teacher and in developing intelligent professional interests in those who intend to become teachers.

This course includes such topics as the following:

The essential characteristics of a learned profession. The teacher and the parent. The teacher and the artisan. The teacher in ancient civilization; in China, India, Greece, Rome, etc. The mediæval teacher. The teacher of the early renaissance. The reformation and the teacher. The great modern schoolmasters, Sturm, Comenius, F. A. Wolf, Pestalozzi, et al. The teaching profession in Germany. The function of the teacher in the schoolroom. Characteristics of the teaching profession as a social group. Fundamental principles concerning the training of teachers. Different plans that have been tried in this and other countries, especially in the training of secondary teachers. The hygiene of teaching. Once a week, half a year.

PEDAGOGICAL APPLICATIONS OF PSYCHOLOGY

In this course study is made of some of the most important chapters in psychology in their educational aspects. The point of view is that of genetic psychology. The aim is to show the infinite complexity and the interrelation of the mental processes in the living, thinking, human being in contrast with the artificial simplicity of the older static psychology, and also to present the natural unity and simplicity of the mental activities and to note practical educational suggestions from this psychology. Such topics as the following are treated: Habit, attention, interest, memory. Apperception and association. Experimental investigations of memory. The learning process. Economical methods of learning. Feeling and interest in relation to instruction and training. The instincts of children as the basis of apperception and interest. Suggestion as a factor in education. The training of the will. Mental diseases and faults of school children. Neuroses of development. Psychological contributions to the hygiene of instruction. One hour a week, throughout the year. Usually given in alternate years.

Other courses are given from time to time in child psychology, the aims and methods of scientific investigations in pedagogy, and present problems in education.

THE WORK OF THE SEMINAR

The Seminar gives opportunity for intensive work in special parts of the field of education. It is expected that each student

will select, after consultation with his instructors, a topic for special investigation. Results of such studies may be published. The work will be determined in part by the needs of the students who elect this course. During the last few years the following subjects have been studied by the Seminar, each student selecting a portion of the general subject: The Organization of Schools in Europe; The History of Education, especially at the time of the renaissance; Experimental Pedagogy; The Development of English Education; Sozial-pädagogik.

A large and valuable library of pedagogical literature has been collected by the department. This is especially rich in books on School Hygiene, Child Study, and the History of Education. The students have access also to a large mass of literature indirectly connected with education, but containing very important contributions, in the departments of Psychology, Anthropology, Biology, History, and Social Science. The Worcester Public Library has a large collection of educational literature. The Library of the American Antiquarian Society, which is open to the students, contains much important material on the history of education. And large numbers of books needed by students in their investigations are bought every year.

V.

BIOLOGY

Both instruction and research in the Department have been divided about equally between Biology proper and Neurology.

The Neurology courses cover the anatomy, physiology and hygiene of the human brain and sense organs and also a comparative study of the nervous system in a series of animals. They supply thus the anatomico-physiological basis for both animal and human psychology. (See special circular.)

VI.

LIBRARY

Mr. Wilson, the librarian, makes a point of keeping in close touch with the work of each student in order that the library may supply the latest contribution in the way of printed literature to each investigator.

During the year he will deliver the following

LECTURES.

1. *Use of the Library.* Location of the books; current periodicals; use of card catalogue; shelf-lists; subject headings; taking references.

2. *Preparing Manuscript for the Press.* Proper names; punctuation; paragraphs; capitalization; marking styles of type; foot notes; figures and diagrams; bibliographies; proof corrections; contracts with publishers.

3. *The Book: its Evolution and History.* Clay tablets and cylinders; papyrus; wax tablets; Greek and Roman scrolls; introduction of paper from China; transmission of ancient books; manuscript books; illuminated books; introduction of printing; the modern book.

4. *Ancient and Mediæval Libraries.* Importance of, in ancient times; among the Greeks and Romans; spoils of war; Alexandrian library; monastic; university; royal collections; private collectors.

5. *Important Modern Libraries.* British Museum; Bibliothèque nationale; Imperial library of St. Petersburg; Royal library of Berlin; the Vatican library; Library of Congress.

6. *Libraries in the United States.* Early libraries; rapid growth in recent years; library administration; library schools; college and university libraries and their special problems; library buildings and furnishings.

COLLEGIATE COURSES

DEPARTMENT OF PSYCHOLOGY

ASSISTANT PROFESSOR PORTER, PROFESSOR BENTLEY

The psychological department of the college as at present organized is responsible for the field of philosophy as well as that of psychology. A two-year course in each subject is accordingly offered.

The purpose of all the courses is less to train specialists than to give such a knowledge of the mind and of its reaction upon the great questions of philosophy as belongs to a well rounded education. The courses will be found, however, to fit the few who may require it for graduate study of these subjects.

Psychology. The first year in psychology is devoted to the ground work of the science, taken slowly with wide collateral reading, and made as concrete as possible by class and individual experiments, demonstrations, charts, diagrams, and models. The second year is given to genetic and applied psychology, the plan being to trace first the gradual unfolding of mind in the animal series and in the human child, and then to give some account of its operations in the more complex fields. In the additional courses opportunity will be given for advanced work in comparative and pathological psychology and for special laboratory practice.

Philosophy. The first year in philosophy is devoted to a general introduction to the subject and to the special disciplines of logic and ethics. The purpose is to present both these subjects concretely, to introduce the student to logic and the methods of science as they are to be observed in actual use, and to assist him in the right estimation of conduct. The second year is given to the history of philosophy, ancient and modern. Chief emphasis is laid on men of the first importance; and it is intended that students shall get something of the style and method of the greatest of these from readings in their works, as well as the place they occupy in the history of philosophic thought in general.

COURSES

The following courses are offered for the year 1907-8:

A

1. General Psychology. (a) The psychology of learning: Habit, practice, skill, and memory. Methods and aids to economic learning. (b) The psychology of truth and error, in perception, in conception, in belief; illusions, prejudices, superstitions, delusions. The psychology of reasoning and the logical processes, true and false. (c) The psychology of conduct and character. The fundamental emotions, fear, anger, and love; their genesis, nature, and hygiene. Types of temperament and character. Volition; the formation and influence of ideals; weakness and strength of will; hygiene and diseases of will. (d) Interdependence of mind and body. The brain and nervous system, anatomically and physiologically considered; the sense organs and elementary sen-

sations. Instinctive activities. Examples of the interdependence of mind and body in health and disease. Hypnotism; faith cures.

This course will be made as concrete and varied as possible by class and individual experiments, demonstrations, and collateral reading. *Three hours.* ASST. PROF. PORTER.

2. Introduction to Philosophy. General introduction. Outlines of logic, inductive and deductive; text-book, exercises, and examination of arguments. Outlines of ethics; text-book, discussions, themes, collateral reading. *Two hours.*

PROFESSOR BENTLEY

B

3. Genetic and Applied Psychology. (a) Comparative psychology: General biological view of mind. Purpose and development of mind in the animal series. Mental development of man. (b) Applications of psychology in pedagogy, law and sociology. Informal lectures, collateral reading, visits to institutions.

This course is offered in part to meet the needs of students intending to become teachers, and of those interested in history, law, and social science. It is desirable that students beginning this course should have completed course 1 as a preliminary; but in exceptional cases it may, by special arrangement with the instructor, be taken without course 1. *Three hours.*

ASST. PROF. PORTER.

4. History of Philosophy. Greek philosophy, text-book: readings in Xenophon, Plato, Aristotle, and the Stoics; readings in the standard histories of the times and of philosophy. Mediæval philosophy. Modern philosophy, text-book, readings from the philosophers, collateral reading. Open to students who have completed course 2. *Two hours.*

PROFESSOR BENTLEY.

ADDITIONAL COURSES.

5. Advanced Comparative Psychology. Seminary and practice work, with assignment of problems for original study when desired. Open to students who have completed course 1. *The equivalent of two hours a week through the year.*

ASST. PROF. PORTER.

6. Laboratory Course. Experiments introducing the student to the most important methods of laboratory psychology and the

standard pieces of apparatus. Minor original problems. Open to the students who have completed course 1. *The equivalent of two hours a week through the year.* ASST. PROF. PORTER.

7. Advanced Course on Selected Modern Philosophers and Modern Tendencies. Open to students who have taken course 2, or are judged by the instructor to be fitted to profit by the course. *Two hours.* PROFESSOR BENTLEY.

8. It is the intention of the department to offer other courses which shall alternate with the additional courses above outlined. It is probable that a course designed more particularly to meet the needs of those students now taking a pre-medical course will be offered during the year 1907-8. This will treat the subjects of Illusions, Hallucinations, Hypnotism and Suggestion, and Mental Pathology. *Two hours.* ASST. PROF. PORTER.

NOTE. Courses 5, 6, 7 and 8 will not be given unless elected by at least two students.

DEPARTMENT OF PEDAGOGY

PROFESSOR BENTLEY

The courses in this department are elective. Their present scope limits the work of the department to the history of education as a social factor in civilization, hence chiefly to the cultural aspects of the subject, and to the study of such facts in the organization and administration of public schools as should be the possession of a layman who might be called upon at any time to take a citizen's share in their management. Students in any group may take these courses under advice.

1. History of Education. A general study of the growth of culture as reflected in efforts at formal education, oriental, classical, mediæval, and modern. Lectures will direct and unify the library work of students. *Three hours.*

2. Educational Classics. This course will meet for a two-hour session one evening in the week at the instructor's house. Its purpose is to study more intensively than in course 1 the most important epochs of the history of European education as represented by the life-work and classical productions of a few master workers. First semester: Pre-Christian and Roman writers. Second semester: Mediæval and Renaissance. Alternates with course 3. Given in 1906-7. *Two hours.*

[3. Modern Educational Classics. Alternates with course 2. Given in 1907-8. *Two hours.*]

4. School systems. First semester: The development of school systems in modern Europe and the United States. Second semester: The administration of public education in the United States, with reference (1) to state systems and state control, (2) to cities and municipal systems. *Three hours.*

JUNE 4-07.

CLARK UNIVERSITY

WORCESTER, MASSACHUSETTS

DEPARTMENT OF ECONOMICS AND SOCIOLOGY

CARROLL D. WRIGHT, PH. D., LL. D., Professor of Statistics and Social Economics. President, Clark College, 1902-.

FREDERICK A. BUSHEE, PH. D., Instructor in Economics and Sociology. Litt. B., Dartmouth, 1894; A. M., Harvard, 1898; Ph. D., Harvard, 1902; Resident South End House, Boston, 1894-95, 1896-97; Hartford School of Sociology, 1895-96; Harvard University, 1897-1900; Collège Libre des Sciences Sociales, Collège de France, Paris, University of Berlin, 1900-01; Assistant in Economics, Harvard University, 1901-02; Instructor in Economics and History, Clark College, 1902-03; Assistant Professor of Economics, 1903- .

The Department of Economics and Sociology was organized at Clark University in 1905. Because of its recent origin some description of the department and announcement of its plans may be of interest. The department is under the direction of the Honorable Carroll D. Wright, President of the Collegiate Department, assisted by Dr. Frederick A. Bushee. The degrees of Master of Arts and Doctor of Philosophy are offered in both Economics and Sociology. The requirements for these degrees accord in general with those of the other departments of the University, and the high standard which has been maintained in the older departments will be insisted upon in this one.

Candidates for both degrees are required to do minor work in some allied department in addition to their major work in this department. Candidates for the degree of Master of Arts must show ability to carry on independent investigations. Candidates for the degree of Doctor of Philosophy must prove their ability to do research work by a thesis which makes a distinct contribution to social science. In every case ability to do research work is considered the most important requirement for the degrees.

The location of Clark University is particularly favorable for economic and sociological investigations. Worcester is a medium-sized city (130,000 inhabitants) with a variety of industries, large and small, and a cosmopolitan population. Hence the opportunities for local studies of industrial and social problems are excellent. State and municipal statistics are sufficiently detailed and accurate to give a basis for such local studies.

The University itself also offers superior advantages for the study of Sociology. Its different departments are closely coordinated, each offering courses intended to supplement the work of allied departments. Thus courses in Psychology, the course in Dynamic Biology and the courses in Anthropology form the natural groundwork for a thorough training in Sociology, while the course in Social Psychology to be offered next year may be considered as an integral part of the work of Sociology itself. Excellent library facilities are offered by the University library, which pays particular attention to the needs of research students. About four thousand volumes are added each year and about two hundred journals are received, including the leading economic and sociological reviews. The University library may be supplemented by the Worcester Public Library and the Library of the American Antiquarian Society.

During the past two years interesting investigations have been made by students in this department. One is a study of the causes of poverty in Worcester by the case counting method. One thousand cases from the records of the Associated Charities have been carefully analyzed, and the causes tabulated, with reference to nationality, size of family, head of family, etc. This study will make a valuable addition to our knowledge of the causes of poverty. It will be especially interesting to see whether these causes in a medium-sized city correspond to those already discovered in the large cities like New York and Chicago. Another study concerns juvenile crime and the treatment of juvenile offenders in Worcester, covering the actual working of the city's system from the boys' clubs and the courts to the truant and reform schools, and will attempt to draw some conclusions as to the results of the system used here and to compare it with the methods employed in other cities. A comprehensive study

of the subject of trusts has also been made and presented as a Master's dissertation.

The courses offered in this department will be varied from year to year, but each year they will be adapted as far as possible to the interests and needs of individual students. The full number of courses offered will include the following:

1. Advanced Theory of Economics.
2. History of Economic Theory.
3. Theory and Use of Statistics.
4. Labor Problems, including Labor Legislation.
5. Theory of Sociology.
6. Literature of Sociology, including the leading theories of the present day.
7. Social Problems, including suicide, divorce, migration of population, fecundity of population, intemperance, pauperism, crime, etc.
8. History of the Theories of Socialism and Communism.
9. Scope and Method of the Social Sciences.
10. Seminary.

For the year 1907-1908 the following courses are offered.

BY PROFESSOR WRIGHT.

3. THEORY AND USE OF STATISTICS. One hour a week, half a year.

Population: Its composition; Immigration; Arrears, urban and rural; Births; Deaths; Marriages; Divorces.

Statistics of Crime: Pauperism; Benevolences, etc.

Statistics of Agriculture: Commerce; Finance.

Statistics of Manufactures: Capital; Products; Cost of Production; Efficiency of Labor; Labor cost, etc.

Wage Statistics: Difficulties attending them; Money wages; real wages; Cost of living; Rates and earnings; Purchasing power of money.

4. LABOR PROBLEMS. One hour a week, half a year.

Under this general title the various features and elements of industrial society will be discussed; including Systems of labor; Evolution of manufactures; The factory system; The regulation of industry by states and individuals; Communism; Municipal socialism; Social democracy and state socialism; Strikes and lockouts; Industrial conciliation and arbitration; Government by injunction; Employers' liability and other features of the labor problem.

10. SEMINARY.

BY DR. BUSHEE.

5. THEORY OF SOCIOLOGY. The aim of this course is to make a systematic presentation of the laws of social progress. The leading biological and

psychological laws will be studied as they have been formulated by American and European writers. *2 hours.*

And one or more of the following courses:

1. **ECONOMIC THEORY** during the 18th and 19th Centuries. The theories of the early economists will be studied with reference to the economic conditions under which they were formulated. The major part of the course, however, will be devoted to recent economic literature and to the present trend of economic thought. *2 hours.*

6. **LITERATURE OF SOCIOLOGY.** In this course a critical examination will be made of the contributions of the leading sociologists, beginning with Auguste Comte, with reference both to their general theories and to their special contributions to the science of Sociology. Other authors to be studied will include Spencer, Ward, Giddings, Loria, De Greef, Gumpłowicz, Coste, Durkheim, Kidd, Tarde, and Simmel. This course presupposes a knowledge of the general principles of Sociology. Those who have not had such preparation may advantageously take the introductory course given in the Collegiate Department. *2 hours.*

7. **SOCIAL PROBLEMS**, including suicide, divorce, migration of population, fecundity of population, intemperance, pauperism, crime, etc. *2 hours.*

8. **SOCIALISM AND COMMUNISM.** This course will consist in an historical survey of the theories of the leading Utopian and scientific Socialists and in a critical examination of the practical experiments in Communism which have been made in the United States and in foreign countries. Special attention will be given to the development of the three leading principles of scientific socialism, the materialistic conception of history, the theory of value, and the class-conscious struggle. These principles will be studied as represented by Marx, Engels, Kautsky, Bebel, Vandervelde, Labriola, Bernstein, Vollmar, Jaurès, and by the English Fabians. *2 hours.*

10. **SEMINARY IN ECONOMICS AND SOCIOLOGY.** Students entering the Seminary will be directed in research work in topics in Economics or in Sociology. Special subjects outside of the regular courses will be discussed and some of the periodic literature will be reviewed.

A number of fellowships and scholarships are available for promising students who need pecuniary assistance. These include University scholarships, covering the tuition fee of \$100; Junior Fellowships, covering the tuition fee and yielding a stipend of \$100 additional; and Senior Fellowships, covering the tuition and yielding a stipend of \$200 additional.

June 6, 07.

CLARK UNIVERSITY

WORCESTER, MASSACHUSETTS

DEPARTMENT OF MATHEMATICS

WILLIAM EDWARD STORY, PH. D., Professor of Mathematics. A. B., Harvard University, 1871; Parker Fellow, 1874-75; Student, Universities of Berlin and Leipzig, 1871-75; Ph. D., Leipzig, 1875; Tutor of Mathematics, Harvard University, 1875-76; Associate, Assistant Professor and Associate Professor of Mathematics, Johns Hopkins University, 1876-89; Professor of Mathematics, Clark University, 1889-; Professor of Mathematics, Clark College, 1902-07; Member of the London Mathematical Society and of the American Mathematical Society; Resident Fellow of the American Academy of Arts and Sciences; Fellow of the American Association for the Advancement of Science.

HENRY TABER, PH. D., Professor of Mathematics. Ph. B., Yale University, 1882; Ph. D., Johns Hopkins University, 1888; Assistant in Mathematics, Johns Hopkins University, 1888-89; Docent in Mathematics, Clark University, 1889-92; Assistant Professor, 1892-1903; Professor, 1903-; Member of the London Mathematical Society, of the Deutsche Mathematische Vereinigung, and of the American Mathematical Society; Resident Fellow of the American Academy of Arts and Sciences.

JOSEPH DE PEROTT, Lecturer in Mathematics. Student, Universities of Paris and Berlin, 1877-80; Docent in Mathematics, Clark University, 1890-1904; Lecturer, 1904-.

FRANK B. WILLIAMS, PH. D., Assistant Professor of Mathematics (Clark College). C. E., Missouri State University, 1890; Teaching Fellow in Mathematics, 1892-93; M. S., 1893; Scholar in Mathematics, Clark University, 1897-98; Fellow, 1898-1900; Ph. D., 1900; Assistant Professor of Mathematics, Union College, 1900-07; Assistant Professor of Mathematics, Clark College, 1907-.

The main object of the department is to fit students for original research in mathematics and, so far as may be feasible, to give them some practice in independent investigation. For this purpose, seminars are conducted by the professors, in which

the student is led gradually, through the careful study of the work of others, especially articles of particular interest that appear in the current journals, of which he is expected to make intelligent reports, and by exercises graduated to the state of his intellectual development, to the investigation of some topic that has not yet been adequately treated by any one, on which he may write a dissertation of some length. This dissertation is the goal toward which the student's efforts are chiefly directed and will not be regarded as satisfactory unless it contains some new results of importance. It usually occupies most of his time and energy during his third year of residence at the University.

But it is considered by us to be necessary for research of any importance that the investigator should have a comprehensive and practical knowledge of the modern methods employed in all the chief branches of mathematics. For the purpose of imparting this knowledge, systematic courses of lectures are given, in which the fundamental principles, methods, and results of all the main branches of pure mathematics are developed consecutively, with such illustrations and applications as may be useful for their intelligent comprehension. These fundamental courses are the Introductory Courses on subjects stated in the following paragraph. In addition to them, special Advanced Courses of lectures are given, in which particular topics of the subjects included in the general range of the introductory courses are treated in greater detail and other subjects lying farther from the main line of mathematical thought (perhaps the more attractive for that reason, although commonly considered not so important) are brought to the student's notice. By these means the student acquires a broad knowledge of the field of mathematics and has the opportunity of getting a very particular knowledge of a certain number of subjects.

The scope of the work will be seen from the following list of courses of which most are given every other year :

History of Mathematics.

Arithmetic.

Theory of Numbers (Introductory and advanced courses).

Finite Differences (Introductory and advanced courses).

Probabilities and Theory of Errors.

Numerical Computations.

Algebra.

Algebraic Substitutions and their application to the theory of equations (introductory course).

Linear Transformations and Algebraic Invariants (introductory course).

Groups, Finite and Continuous.

Theory of Quadratic Forms.

Simultaneous Equations (including restricted systems).

Infinitesimal Calculus.

Differential Equations (introductory course).

Definite Integrals (introductory course).

Calculus of Variations (introductory course).

Theory of Functions.

General Theory of Functions (introductory course).

Elliptic Functions (introductory course).

Abelian Integrals.

Geometry.

Higher Plane Curves, Higher Surfaces, and Twisted Curves (introductory course).

Hyperspace and Noneuclidean Geometry.

Modern Synthetic Geometry (introductory course).

Differential Geometry.

Transformation of Curves and Surfaces.

Analysis Situs.

Multiple Algebra.

Multiple Algebra in general.

Quaternions.

Symbolic Logic.

Every candidate for the Doctor's degree in Mathematics is expected to take all the introductory courses, each in the first year of his residence in which it is given, unless he has already had a substantial equivalent for it. As a rule, these courses are carried so far that the student should have no great difficulty in finding a topic for independent investigation in any of them. Other courses

than those named will be given from time to time, as there may appear to be a demand for them. In any course the main stress will be laid upon methods rather than upon results, so as to enable the student to utilize what he learns in the solution of new problems and not merely to repeat perfunctorily the work of others, but the classic problems are not neglected; preparation for original research is the chief object of all our instruction.

Special students and others not candidates for a degree may select such courses as they prefer; all the privileges of the university are open to them as freely as to candidates for degrees, and special courses will be arranged for them, in so far as this is feasible.

To all students the instructors are always accessible for consultation and advice. The members of the staff will spare no pains to give all the assistance that may be needed in matters connected with regular courses or individual work.

MATERIAL FACILITIES

The library of the university is well equipped with standard treatises on the various branches of pure mathematics, monographs, mathematical journals, the proceedings and transactions of mathematical and other learned societies, collected works of mathematicians, histories of mathematics, and bibliographies. Additions to this collection are being made continually, and books really needed will be procured if they are in the market. The library also borrows from other libraries such works as are not otherwise obtainable or are wanted only for temporary use. Students have direct access to all parts of the library. The department is making a general catalogue of mathematical books and papers, which already includes about fifty thousand titles, and to which all students of mathematics may have access. We have also a fairly large collection of models and other illustrative material, which is constantly used in the lecture-room.

During the academic year 1907-08 the following courses will be given:

Professor Story will lecture on

Analytic Geometry of Higher Plane Curves, Higher Surfaces, and Twisted Curves (introductory course);

Linear Transformations and Algebraic Invariants (introductory course);

Differential Geometry;

Non-euclidean Geometry;

Theory of Errors.

Dr. Taber will lecture on the following subjects :

Theory of Differential Equations (introductory course);

Differential Equations, including Lie's Theory (advanced course);

Calculus of Variations (introductory course);

Theory of Groups of Linear Substitutions.

M. de Perott will give introductory courses in

Theory of Numbers;

Algebraic substitutions and their application to the Theory of Equations.

Dr. Story will conduct a Seminary in connection with the course in Analytic Geometry, and will guide advanced students in original research.

Dr. Taber will conduct a Seminary weekly throughout the year in connection with the advanced course in Differential Equations and the lectures on Groups of Linear Substitutions. The application of the latter theory to linear differential equations will be treated in the Seminary. To a student admitted to the Seminary topics connected with the lectures are assigned; he is required to study the literature relating to his topic, and to deliver a short lecture thereon.

Successful original work, resulting in widening in some measure the bounds of mathematical knowledge, is a foremost requisite for the doctor's degree. The work done by the student in the Seminary serves as a preparation for research on some special topic. Moreover, in conducting the Seminary, the effort is made to train the student in the mode of presenting his subject, both in perfecting his grasp of the fundamental conceptions and in the presentation of details. The Seminary thus serves as a preparation and apprenticeship for the profession of teacher. A Seminary in connection with the courses of lectures fulfills, in some measure, the function of the laboratory in the physical

sciences, the importance of which is universally recognized. In much the same way, it brings the student into actual contact with his subject, which is thereafter no longer an abstraction but intensely real. In the stimulating contact of teacher and student which the Seminary affords, the zeal for new knowledge is most successfully imparted. In the Seminary the student first becomes a master of a small part of his subject, and learns to transform mathematical relations in a creative spirit; and his mental processes become active processes of will, instead of being merely passive states of attention. It is desirable, in a subject so abstract as mathematics, that the lectures in connection with the Seminary should present such fundamental elements and conceptions as shall stimulate the student to master the subject and its details for himself. Such a mode of mathematical teaching obtains in some of the best universities abroad; and as far as circumstances permit this method is employed in the Seminary.

With the larger facilities that may come to the University in the future, it may be possible to extend these less formal methods. Such methods are, however, difficult to apply, as work done in the Seminary (estimated generally in this country as requiring double the time expended by the teacher in lecturing) in reality takes four to five times the time required for a course of lectures covering the details as well as the general conceptions of the same subject.

June 17-07.

CLARK UNIVERSITY

WORCESTER, MASSACHUSETTS

DEPARTMENT OF BIOLOGY

CLIFTON F. HODGE, PH. D., Professor of Biology, A. B., Ripon College, 1882; Fellow in Biology, Johns Hopkins University, 1888-89; Ph. D., Johns Hopkins University, 1889; Fellow in Psychology and Assistant in Neurology, Clark University, 1889-91; Instructor in Biology, University of Wisconsin, 1891-92; Assistant Professor of Physiology and Neurology, Clark University, 1891-1906; Professor of Biology, Clark College, 1902; Clark University, 1906- .

MILLETT TAYLOR THOMPSON, PH. D., Honorary Fellow in Morphology (Collegiate Assistant Professor of Zoölogy), A. B., Brown University, 1898; Ph. D., 1902; Fellow in Biology, Clark University, 1902-03; Honorary Fellow, 1903-06; Instructor in Zoölogy, Clark College, 1902-06; Assistant Professor, 1906- .

ORIS P. DELLINGER, A. B., University Fellow and Collegiate Assistant in Physiology and Hygiene, A. B., Indiana University, 1904; Graduate, Indiana State Normal School, 1900; Student, University of Chicago, 1900-1; Assistant in Biology, Indiana State Normal School, 1901-3; Assistant in Botany, Indiana University Biological Station, 1903-4; Instructor, 1905; Fellow in Biology, Clark University, 1904-7; Assistant in Biology, Clark College, 1904- .

WILLIAM F. COPELAND, PH. M., Fellow in Biology, Collegiate Assistant in Botany, Ph. B., Ohio University, 1902; Ph. M., 1903; Assistant in Biology and Geology, *ibid.*, 1902-05; Fellow in Biology, Clark University, 1905-06; Assistant in Botany, Clark College, 1906- .

The Bibliological Department occupies seven consecutive rooms on the second floor of the main University building, somewhat more than half the space on this floor. Two of the rooms are large—45 x 50 feet—suitable for class and larger-group seminary, lecture and laboratory work. The other rooms are smaller, designed and used as private research or small-class laboratories. All the rooms are conveniently equipped with water, gas and

electricity. An excellent dark room is centrally located and is in almost constant use.

The laboratories are well supplied with the best apparatus and instruments obtainable for purposes of both instruction and research, and every effort is made to secure by purchase or construction any new or improved apparatus which researches in the department may require. Negotiations are now pending for the purchase of the new Zeiss ultra violet microscope which has doubled the magnification of the ordinary instruments. It is hoped and expected that this may be installed during the present summer. All the problems of minute structure of muscle, nerve, and protoplasm must now be opened up afresh and submitted to the test of this instrument. This merely hints at its possibilities for research.

The great handicap under which the Department has labored for the ten years past—lack of suitable land for breeding experiments and out-of-doors study of living types—has now been removed, Dr. Hodge having purchased seven acres of land within easy access of the University. This land, which is admirably suited to the purpose, containing as it does brook, marsh, hillside, and orchard, is already being freely utilized and is being planned and planted so as to serve as an out-of-doors laboratory for the Department. This will afford facilities for practical work on animal and plant rearing and breeding under experimental conditions, a number of researches planned by Dr. Hodge having long awaited the opportunity which this tract of land now presents. It will also supply favorable possibilities for study of many problems relating to birds, insects, fungi and other common forms of life. The importance of this side of the Department's work will be clear as we proceed.

When we consider the large amount of money and energy expended on biological expeditions, marine and even desert laboratories, remote and exceptional phases of the science, it must appear self evident that a laboratory might well specialize upon the many problems unsolved and not yet formulated, that surround the average home and touch most closely the life and interests of every community.

Both instruction and research in the Department have been about equally divided between biology proper, including general

physiology; and neurology, which covers the anatomy, physiology and hygiene of the human brain, nervous system and sense organs and also comparative neurology.

The neurology courses thus supply the anatomico-physiological basis for both human and animal psychology. Full laboratory work, both class, and demonstrational and individual, accompany these courses. This is directed toward giving students a knowledge of the organs themselves, and also practical working acquaintance with methods of research in preparation and technique, both macro and microscopical. Each student is thus assisted in making his own complete series of demonstrational preparations, which have proved invaluable in subsequent teaching.

Next to the actual specimens, models, charts and diagrams are of special value in teaching this complicated subject, and the Department is supplied with a unique series of these. Many photographs of them have been made and students can supplement their specimens with prints and lantern slides, made from the laboratory collection of negatives.

Researches in progress in this field at present are :

Changes in nerve cells due to starvation. Mr. A. H. Estabrook (with Dr. F. W. Barrows).

Effects of cerebral extirpations upon the offspring of pigeons. Dr. W. F. Robie.

Comparative Structure of Nerve Fibers. Mr. H. B. Davis.

Hygiene of Sleep in Infants. Dr. C. A. Osborne.

On the side of general biology a new course has been organized, which also serves as a basis for more special work in animal psychology. This course has been called "Dynamic Biology," since it shifts the emphasis from anatomical structures to vital activities and reactions. It aims at a study of species and groups of animals and plants as acting and reacting forces in nature rather than as dead forms. The method of this course is essentially that of Darwin, and the more special type studies which foreshadow this kind of biology are his Coral Islands and earthworms and vegetable mould.

Instruction in Dynamic Biology consists of a year's course of lectures by Dr. Hodge. About one-half the year is taken up with a consideration of a series of species studied as forces in nature, —types among the protozoans, celenterates, worms, mollusks and

crustaceans, insects, birds and mammals. The other half is devoted to the theoretical side of the subject,—evolution, experimental morphology and heredity.

The above courses have of late years been ably supplemented by special courses offered by Dr. Thompson in Comparative Morphology and the History of Evolution.

Investigations in Dynamic Biology tend in three rather distinct directions:

1. *Reactions of Species to Different Biological Conditions.* This line of work deals with analysis of environmental factors which, under natural and experimental conditions make for health, strength, vigor and efficiency of species, or the reverse. Many researches of this character are projected, and may now be carried forward on the tract of land above alluded to. The following have been completed and published or are in progress.

Physiological Influence of Alcohol, Dr. Hodge—on growth of yeast plants, and on cats and dogs—in Report of Committee of Fifty, Physiological Aspects of the Liquor Problem, Houghton, Mifflin & Co.

Structure and Biology of the Yeast Plant, Dr. Mutchler.

Biology of Spirogyra, Mr. Copeland (just completed for a doctor's thesis).

2. *Normal Daily Life, and Rhythms of Rest and Activity in a Series of Animals.* The attempt here is to discover, parallel with comparative anatomy, comparative physiological rhythms, *e. g.*, the origin and significance in the animal series of fatigue and sleep or rest, nutritional rhythms of hunger and feeding, play and muscular exercise, sex and reproductive cycles. Researches from the Department in this line are:

The Daily Life of a Protozoan (Vorticella) Dr. Hodge with Dr. H. A. Aikins. *Am. Jour. Psychology*, 1895.

Variations in Daily Activity produced by Alcohol and by changes in Barometric Pressure and Diet, with a Description of Recording Methods. Dr. Stewart, *Am. Jour. of Physiol.*, 1898.

Daily Life of Amoeba proteus, Dr. Gibbs and Mr. Dellinger, 1906. Unpublished.

Rhythms of Rest and Activity in Hydra, fusca and veridis, Mr. Stickney (unpublished).

Rhythms of Rest and Activity in the Earthworm, Mr. Baldwin (in process of completion).

3. *The Study of Species as Forces in Nature.* This division has to do with the work of species as biological units in the organization of living nature. In method it consists in studying minutely and accurately the activities, especially food relations, of individuals, and from the results computing the work of the species as a whole. Habits, instincts and psychic reactions of species must form a part of the work in this whole field and thus it forms close connections with psychology. It is planned to work out a fairly complete series of birds, insects, amphibians, fishes, crustaceans, worms, mollusks, and mammals from this point of view. In the place of guesses and all manner of loose statements as to the value of the work of different species, we may, as this work advances, substitute for them the exact data, a knowledge of which biology owes to the community, and which must necessarily precede adequate utilization and control of living forces by man. Publications and researches are:

Dynamic Biology, Dr. Hodge, *Ped. Sem.*, 1904.

Biology of the Ruffed Grouse, Dr. Hodge (preliminary reports have been printed in Mass. Commission Fisheries, 1905, and Game Reports, 1904 and 1905, and in Country Calendar, and Country Life in America, 1906). This work is now in its fifth year and is being carried on under a grant from the Carnegie Institution.

Biology of the American Quail, a companion study of the above, begun last year by Dr. Hodge and to be continued under the same Carnegie Grant.

The Biology of the Peach Tree with Special Reference to Cause of Peach Yellows, Miss Anna A. Schryver.

The Rôle of the Cat in Dissemination of Disease, Dr. C. A. Osborne (ready for publication).

The Cat in Relation to Bird Life, Miss Edith M. Dixon.

Biology of the American Toad, Mr. Newton Miller.

The Morphology of Certain Oak Galls, Mr. Chas. E. Disney.

The Relation of Woodpeckers to Forestry and Lumber Interests, Mr. A. N. Miller.

In addition to the subject matter of the science Dr. Hodge has devoted particular attention to biological instruction and has developed a special course of lectures outlining a practical stratifica-

tion of the subject in our educational system. The public school stratum is embodied in his Nature Study, published in 1902. Dr. Hodge, in collaboration with Dr. Dawson, who has had successful experience in high-school science teaching, has nearly completed a text-book for high-school biology. His text embodying the course in the Collegiate Department is also well under way. In the present chaotic state of biological instruction, university students should devote special attention to determining subject matter and methods suitable to our different educational strata.

In order to determine the causes of physiological rhythms it becomes necessary to analyze changes in cells and protoplasm due to fatigue, hunger, or other normal or abnormal conditions. This phase of the subject relates itself to Dr. Hodge's earliest studies in the physiology of nerve cells, and has now, as necessity has indicated, broadened out into a plan for similar study of all active tissues. Recent work in this line is indicated by the following titles:

A Comparative Study of Contractile Tissue, F. N. Duncan.

Locomotion of Amebae and Allied Forms, O. P. Dellinger, Jour. Exp. Zoöl., Vol. III.

Functions and Structures in Ameba proteus, C. F. Hodge and O. P. Dillinger. (About ready for press.)

Comparative Study of Cilia and Flagellae as bearing upon the Structure of Contractile Protoplasm, O. P. Dellinger.

June 17-1907.

CLARK UNIVERSITY

Saturday Courses for Teachers

ACADEMIC YEAR, 1907-08.

Clark University offers to teachers, superintendents and principals, and to the public, as well as to students in all departments of the University, special courses of lectures on educational topics on Saturday mornings.

These lectures will begin Saturday, September 28th.

The courses are as follows:

COURSE I.

PRESIDENT CARROLL D. WRIGHT. (9-10 A. M. Room 51, Main Building. Saturdays throughout the year.)

STATISTICS AND SOCIAL ECONOMICS. Twelve lectures on the use of statistics; the balance of the course on applied economics, involving a discussion of present-day problems. The aim is to teach the principles, theory, and practice of the statistical method, illustrating its use and abuse in presenting data relating to population, production, commerce, wages, prices, crime, etc. Under social economics the course deals with principles of social economics, elements of industrial society, systems of industry, evolution of manufactures, the factory system, the regulation of labor, strikes, arbitration, effects of machinery, prison labor, cooperation, savings institutions, labor legislation, labor organizations, socialism, etc., etc.

The fee for this course alone will be \$10.00 for the entire year, or \$6.00 for each half year.

COURSE II.

PROFESSOR W. H. BURNHAM. (10-11 A. M. Room 71, Main Building. Saturdays throughout the year.)

THE HYGIENE OF THE SCHOOL CHILD. This course includes such topics as: The conditions that determine

growth and development. The adaptation of education to physiological age. The general principles of somatic and mental hygiene. The hygiene of the senses. Modern studies of defects of sight and hearing. School diseases. The hygiene of the voice, the mouth, the teeth, and the nose. Mental diseases and faults of children. Neuroses of development. Tests of ability to work and of physical condition. Medical inspection. The hygiene of discipline. The development of habits of healthful mental activity. The hygiene of memory, of attention, and of feeling. Results of recent studies presented at the International Congress on School Hygiene at London and in current journals.

The fee for this course alone will be \$10.00 for the entire year, or \$6.00 for each half year.

COURSE III.

PRESIDENT G. STANLEY HALL. (11-12 A. M. Room 71, Main Building. Saturdays throughout the year.)

CHANGES AND IMPROVEMENTS MOST NEEDED IN MODERN AND ESPECIALLY AMERICAN EDUCATION. While pointing out clearly imperfections in current systems institutions and methods of popular education, this course will by no means be primarily critical, but constructive. Recognizing that the day of unqualified laudation of the existing educational status which has so long prevailed is now rapidly passing away and that the interval between prospectus and performance; between what we know of school hygiene, pedagogic economy, the results of child study and experimental didactics and the applications of that knowledge; between the public utterances of the spokesmen and salaried promoters of education and the private anxieties of actual teachers has never been so great, it is felt that the time is ripe and that an academic course is the place for a careful and honest attempt at a diagnosis of symptoms and for the prescription of reme-

dial measures and especially those now fully confirmed by science or successfully put into operation elsewhere. This will involve the discussion of very many of the most general and also of the most special questions, such as

The general problem of illiteracy, just why and how far it is a handicap, its causes and its cures; the same for truancy; the growing prevalence of female teachers; how attendance at school affects the child physically, intellectually and socially; why the school does not do more for morality and for life and how it can be made to do so; the advantages and the disadvantages of the secularization of education; the ethical value and methods of religious training; are the schools practical enough; how far does the school make headway against and how far does it diffuse outgrown superstitions; the advantages and disadvantages of free schools; of the elective system especially in high schools; of the present system of school boards and superintendents; of uniformity and over-organization; of teachers' organizations and meetings; both sides of the pension question; salaries for men and women; normal schools, the quality of their pupils, teachers and work; summer schools; college pedagogy; existing methods of recruiting from and prescription for high schools by colleges; athleticism; secret and other pupil organizations; schemes for examination and promotion; school reports and catalogues; bright and dull pupils; how to provide for each; special teachers and teaching; tenure and permanence of teachers and school officers; discipline, including rewards and punishments; text books, pedagogically and financially considered; educational legislation; journalism; defectives; charities, and corrective education.

The value, pedagogy, and methods of special high school studies in the order of their frequency, viz., algebra, Latin, English literature, rhetoric, history, geometry, physiology, physical geography, German, civics, French, chemistry, geology, astronomy, trigo-

nometry, Greek, psychology, special training and qualification for high school teachers. Elementary topics, including reading, writing, arithmetic, geography, English, music, household industries, kindergarten.

History and effects of international influences in education from Horace Mann and Barnard down to the Mosely Commission and the exchange of professors, reformed spelling, auxiliary institutions, parents' association, continuation, evening and correspondence schools, play grounds, value of different kinds of play, excursions, travel, further education of teachers in office, associations, sabbatical year, use of vacations, journals and teachers' reading courses and circles, manual and industrial training, value of the different popular kinds of industrial training.

In this course, charts, diagrams and especially illustrations, books and apparatus will be shown. Dr. Wilson, the Librarian, will assist with references, etc.

The fee for this course alone will be \$10.00 for the entire year, or \$6.00 for each half year.

The fee for all of the above courses will be \$20.00 for the entire year, or \$12.00 for each half year.

All fees for each and all of these courses are remitted to full members of the University and College.

The Library, both its educational and other departments, will be open gratuitously during the year to all who take any part of this work.

Those teachers who may desire special aid in their work or in preparing papers, will receive assistance upon application to the instructors or to the librarian.

For further particulars address or consult

MISS FLORENCE CHANDLER

Clark University

Worcester, Mass.

Oct. 1907.



Clark University
in the City of Worcester
Massachusetts

Register and
Twentieth Official
Announcement

1908

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Twentieth Official Announcement

WORCESTER, MASSACHUSETTS

PUBLISHED FOR THE UNIVERSITY

March, 1908

CALENDAR 1908-1909

1908

| | | | |
|-------|----|----------|------------------------------------|
| MAR. | 30 | Monday | } Spring Recess |
| APRIL | 4 | Saturday | |
| APRIL | 20 | Monday | Patriot's Day |
| MAY | 30 | Saturday | Memorial Day |
| JUNE | 18 | Thursday | Nineteenth academic year closes |

Summer Vacation of 14 Weeks

| | | | |
|-------|----|----------|-----------------------------------|
| SEPT. | 24 | Thursday | Twentieth academic year begins |
| NOV. | 26 | Thursday | Thanksgiving Day |
| DEC. | 25 | Friday | } Christmas Recess |
| 1909 | | | |
| JAN. | 2 | Saturday | } Founder's Day* |
| FEB. | 1 | Monday | |
| FEB. | 22 | Monday | Washington's Birthday |
| APRIL | 5 | Monday | } Spring Recess |
| APRIL | 10 | Saturday | |
| APRIL | 19 | Monday | Patriot's Day |
| MAY | 31 | Monday | Memorial Day |
| JUNE | 17 | Thursday | Twentieth academic year closes |

*Not a holiday

MEMBERS

STAFF

G. STANLEY HALL, PH. D., LL. D. 94 Woodland St.
President of the University and Professor of Psychology

A. B., Williams College, 1867; A. M., 1870; Ph. D., Harvard University, 1878; Lecturer in Harvard and Williams Colleges, 1880-81; Professor of Psychology, Johns Hopkins University, 1881-88; LL. D., University of Michigan, 1888; Williams College, 1889, and Johns Hopkins University, 1902; Chairman of the Library Committee and Curator of the Art Collection, Clark University. Resident member of the Massachusetts Historical Society.

WILLIAM E. STORY, PH. D. 17 Hammond St.
Professor of Mathematics

A. B., Harvard University, 1871; Ph. D., Leipzig, 1875; Parker Fellow (Harvard), 1874-75; Tutor of Mathematics, Harvard University, 1875-76; Associate, Assistant Professor, and Associate Professor of Mathematics, Johns Hopkins University, 1876-89; Professor of Mathematics, Clark College, 1902-07. Member of the London Mathematical Society; Resident Fellow of the American Academy of Arts and Sciences.

EDMUND C. SANFORD, PH. D. 24 Richards St.
Professor of Experimental and Comparative Psychology

A. B., University of California, 1883; Fellow, Johns Hopkins University, 1887; Ph. D., Johns Hopkins University, 1888; Instructor in Psychology, Johns Hopkins University, 1888; Instructor in Psychology, Clark University, 1889-92; Assistant Professor, 1892-1900; Professor of Psychology, Clark College, 1903-07; Director of Psychological Laboratories.

ARTHUR G. WEBSTER, PH. D., D. Sc. 66 West St.
Professor of Physics

A. B., Harvard University, 1885; Instructor in Mathematics, Harvard University, 1885-86; Parker Fellow, 1886-89; Student, Universities of Berlin, Paris, Stockholm, 1886-90; Ph. D., Berlin, 1890; Docent in Physics, Clark University, 1890-92; Assistant Professor, 1892-1900; Professor of Physics, Clark College, 1902-07; Director of Physical Laboratories; D. Sc., Tufts College, 1905. Member National Academy of Sciences; Resident Fellow of the American Academy of Arts and Sciences; Member of the American Philosophical Society.

HENRY TABER, PH. D. 65 West St.
Professor of Mathematics

Ph. B., Yale University, 1882; Ph. D., Johns Hopkins University, 1888; Assistant in Mathematics, Johns Hopkins University, 1888-89; Docent in Mathematics, Clark University, 1889-92; Assistant Professor, 1892-1903. Member of the London Mathematical Society; Resident Fellow of the American Academy of Arts and Sciences.

CARROLL D. WRIGHT, PH. D., LL. D. 96 Woodland St.
Professor of Statistics and Social Economics
President, Clark College, 1902-.

CLIFTON F. HODGE, PH. D. 3 Charlotte St.
Professor of Biology
A. B., Ripon College, 1882; Fellow in Biology, Johns Hopkins University, 1888-89; Ph. D., Johns Hopkins University, 1889; Fellow in Psychology and Assistant in Neurology, Clark University, 1889-91; Instructor in Biology, University of Wisconsin, 1891-92; Assistant Professor of Physiology and Neurology, Clark University, 1891-1906; Professor of Biology, Clark College, 1902-.

WILLIAM H. BURNHAM, PH. D. 100 Chatham St.
Professor of Pedagogy
A. B., Harvard University, 1882; Instructor in Wittenberg College, 1882-83; Instructor, State Normal School, Potsdam, N. Y., 1883-85; Fellow, Johns Hopkins University, 1885-86; Ph. D., 1888, and Instructor in Psychology, 1888-89; Docent in Pedagogy, Clark University, 1890-92; Instructor, 1892-1900; Assistant Professor, 1900-1906.

ALEXANDER F. CHAMBERLAIN, PH. D. 19 Baker St.
Assistant Professor of Anthropology
B. A. (1886), M. A. (1889), University of Toronto; Fellow in Modern Languages, University College, Toronto, 1887-90; Librarian, Canadian Institute, Toronto, 1889-90; Fellow in Anthropology, Clark University, 1890-92; Ph. D., Clark University, 1892; Lecturer in Anthropology, Clark University, 1892-1900; Acting Assistant Professor, 1900-04; Associate Editor, *American Antiquarian*; Editor, *Journal of American Folk-Lore*; Corresponding Member O Instituto do Coimbra, Portugal; Member of the American Antiquarian Society.

MARTIN A. ROSANOFF, PH. B. 2 Grand St.
Assistant Professor of Chemistry
Ph. B., New York University, 1895; Student, University of Berlin, 1895-96; University of Paris, 1896-98; Research Fellow, New York University, 1899-1900; Instructor in Theoretical Chemistry, New York University, 1904-05; Assistant Professor of Chemistry, 1905-07; Assistant Professor of Organic Chemistry, Clark College, 1907-; Director of Chemical Laboratories.

JOSEPH DE PEROTT 5 Hawthorn St.
Lecturer in Mathematics
Student, Universities of Paris and Berlin, 1877-80.

LOUIS N. WILSON, Litt. D. 11 Shirley St.
Librarian of the University and Custodian of the Art Collection
A. B., Clark University, 1905; Litt. D., Tufts College, 1905.

FREDERICK A. BUSHEE, PH. D. 45 Hollywood St.
Instructor in Economics and Sociology
Litt. B., Dartmouth College, 1894; A. M., Harvard University, 1898; Ph. D., 1902; Resident South End House, Boston, 1894-95, 1896-97; Hartford School of Sociology, 1895-96; Harvard University, 1897-1900; Collège Libre des Sciences Sociales, Collège de France, Paris, University of Berlin, 1900-01; Assistant in Economics, Harvard University, 1901-02; Instructor in Economics and History, Clark College, 1902-03; Assistant Professor of Economics, 1903-.

BENJAMIN S. MERIGOLD, PH. D.

Instructor in Chemistry

59 Chatham St.

A. B., Harvard University, 1896; A. M., 1897; Ph. D., 1901; Assistant in Chemistry, Harvard University, 1896-1900; Instructor in Chemistry, Worcester Polytechnic Institute, 1900-1903; Assistant Professor of Chemistry, Clark College, 1903- .

GEORGE H. BLAKESLEE, PH. D.

Instructor in History

940 Main St.

A. B., Wesleyan University, 1893; A. M., Harvard University, 1899; Ph. D., 1903; Student, Johns Hopkins University, 1893-94; Parker Fellow, Harvard, 1901-02; Student, Universities of Berlin, Leipzig, and Oxford, 1901-03; Instructor in History, Clark College, 1903-04; Assistant Professor, 1904- .

ANNUAL APPOINTMENTS**EDWARD COWLES, M. D., LL. D.**

Non-Resident Lecturer on Psychiatry

Boston, Mass.

A. B., Dartmouth College, 1859; A. M., 1863; Medical House Pupil, Retreat for the Insane, Hartford, Conn., 1860-62; M. D., Dartmouth Medical School, 1863; M. D., College of Physicians and Surgeons, New York, 1863; Medical Corps, United States Army, 1863-72; Resident Physician and Superintendent, Boston City Hospital, 1872-79; Medical Superintendent, McLean Hospital, Waverley, Mass., 1879-1903; Lecturer on Mental Diseases, Dartmouth Medical School, 1885-86; Professor of Mental Diseases, *ibid.*, 1886- ; Fellow by Courtesy, Johns Hopkins University, 1887-88; Clinical Instructor in Mental Diseases, Harvard Medical School, 1888-; LL. D., Dartmouth College, 1890.

HONORARY FELLOWS**ALVIN BORGQUIST, PH. D.**

Honorary Fellow in Psychology

20 Curtis St.

B. S., University of Utah, and Graduate, State Normal School, Utah, 1897; Graduate Student, Leland Stanford Jr. University, January 1898-May 1903; Graduate Student, University of California, 1903-04; Fellow in Psychology, Clark University, 1904-05; Research Assistant to Professor Sanford, 1905-06; Ph. D., Clark University, 1906; Instructor in Psychology, Fairmount College, Kansas, 1906-07.

ORIS P. DELLINGER, PH. D.

Honorary Fellow in Biology

101 May St.

Graduate, Indiana State Normal School, 1900; Student, University of Chicago, 1900-01; Assistant in Biology, Indiana State Normal School, 1901-03; A. B., Indiana University, 1904; Fellow in Biology, Clark University, 1904-06; Ph. D., Clark University, 1907; Assistant in Biology, Clark College, 1904-07; Instructor, 1907- .

CHARLES WILSON EASLEY, A. M.

Honorary Fellow in Chemistry

87 Woodland St.

A. B., Dickinson College, 1897; A. M., 1899; Scholar in Physics, Clark University, 1901-02; Fellow, 1902-03; Honorary Fellow, 1903-04; Honorary Fellow in Chemistry, 1906-07; Instructor in Chemistry, Clark College, 1902- .

CEPHAS GUILLET, PH. D., Toronto, Canada
 Honorary Fellow in Psychology 1 Agawam St.

B. A., Victoria University, 1887; Student at Law, Osgood Hall, Toronto, 1894-95; Scholar in Psychology, Clark University, 1895-96; Fellow, 1896-98; Ph. D., Clark University, 1898.

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B. S., University of Colorado, 1901; Scholar in Physics, Clark University, and Assistant to Professor Webster, 1901-02; Fellow, 1902-04; Ph. D., Clark University, 1904; Instructor in Physics, Simmons College, 1904-05; Assistant Professor of Physics, New York University, 1905-06; Assistant Professor of Physics, Clark College, 1906-.

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Graduate, Tokio Imperial University, 1904; Fellow in Psychology, Clark University, 1905-07; Ph. D., Clark University, 1907.

JOSIAH MORSE, PH. D.
 Honorary Fellow in Psychology 40 Wellington St.

A. B., Richmond College, 1899; A. M., 1900; Scholar in Psychology, Clark University, 1900-01; Fellow, 1901-04; Honorary Fellow and Assistant, 1904-05; Honorary Fellow, 1906-07; Ph. D., Clark University, 1905; Instructor in Psychology and Education, University of Texas, 1905-06.

CAROLINE A. OSBORNE, A. M.
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M. D., Woman's Medical College of Pennsylvania, 1899; Superintendent of Nurses, Memorial Hospital, Worcester, Mass., 1899-1904; Instructor of Nurses, *ibid.*, 1904-; Student in Biology, Clark University, 1901-05; Fellow, 1905-06; Honorary Fellow, 1906-07; A. M., Clark University, 1907.

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A. B., Indiana University, 1898; A. M., 1901; Student, Indiana State Normal School, 1890-91, 1892-93; Instructor in Psychology, Indiana University, 1900-03; In charge of Work in Neurology, Indiana University Biological Station, 1901 and 1903; Honorary Fellow in Psychology, Clark University, 1903-07; Ph. D., Clark University, 1906; Instructor in Psychology, Clark College, 1903-07; Assistant Professor, 1907-.

THOMAS LANSING PORTER, B. S., Evanston, Illinois
 Research Assistant to Professor Webster 18 Gates St.

B. S., Northwestern University, 1907; Laboratory Assistant in Physics *ibid.*, 1906-07.

W. F. ROBIE, M. D., Baldwinville, Massachusetts
Honorary Fellow in Psychology and Biology

A. B., Dartmouth College, 1889; M. D., Dartmouth Medical School, 1893
Assistant Physician, Hospital Cottages, 1892-94; Supt. Riverview Sanitarium, 1902-07; Pine Terrace Sanitarium, 1907- ; Student in Psychology and Biology, Clark University, 1904-05; Honorary Fellow, 1905-07.

THEODATE L. SMITH, PH. D.

Research Assistant to President Hall 23 Maywood St.

A. B., Smith College, 1882; A. M., 1884; Yale University, 1893-95; Special Student Clark University, 1895-96; Ph. D., Yale University, 1896; Cornell University, 1900; Assistant to President Hall in research work under Carnegie Grant, Clark University, 1902-04; Estabrook Grant, October 1904-February 1905; Berlin University, April-August, 1905; Research Assistant to President Hall, Clark University, 1905- .

WILLIAM E. STORY, JR., PH. D.

Research Assistant to Professor Webster 17 Hammond St.

A. B., Harvard University, 1904; Scholar in Physics, Clark University 1904-05; Fellow, 1905-07; Ph. D., Clark University, 1907.

AMY ELIZA TANNER, PH. D., Faribault, Minnesota

Honorary Fellow in Psychology 4 Woodbine St.

A. B., University of Michigan, 1893; Scholar, University of Chicago, 1894-95; Fellow, 1905-08; Ph. D., University of Chicago, 1898; Associate in Philosophy, *ibid.*, 1898-1902; Professor of Philosophy, Wilson College, 1903-07.

FELLOWS AND SCHOLARS

NORMAN HERBERT ANNING, M. A., Oxmead, Canada

Fellow in Mathematics 8 Loudon St.

B. A., Queen's University, Kingston, Canada, 1905; M. A., 1906; Tutor in Physics, *ibid.*, 1903-04; Tutor in Mathematics, 1904-05; Fellow in Mathematics, Clark University, 1906-07.

JOHN FRANKLIN BOBBITT, A. B.

Fellow in Pedagogy 15 Piedmont St.

A. B., Indiana University, 1901; Principal of Normal School, Mindanao, 1902-03; Instructor in Educational Methods, Manila Normal School, 1903-07

JOHANNES BROENE, A. M., Grand Rapids, Michigan

Fellow in Psychology 78 Florence St.

Pd. B., Valparaiso University, 1906; Scholar in Psychology, Clark University, 1906-07; A. M., Clark University, 1907.

ERNEST WILLIAM COFFIN, B. A., Charlottetown, Canada

Fellow in Psychology 78 Florence St.

B. A., Dalhousie University, 1902; Fellow in Psychology, Clark University, 1905-07.

HERBERT BURNHAM DAVIS, A. B.

Fellow in Psychology 54 Florence St.

A. B., Bates College, 1890; Scholar in Psychology, Clark University, 1906-07.

LOUISE ELLISON, A. M., St. Louis, Missouri

Fellow in Psychology 2 Woodbine St.

A. B., Washington University, 1906; Scholar in Psychology, Clark University, 1906-07; A. M., Clark University, 1907.

- GORDON SCOTT FULCHER, M. S., Evanston, Illinois
Fellow in Physics 17 Oread Place
B. S., Northwestern University, 1905; M. S., 1906; Fellow in Physics, *ibid.*, 1905-06; Research Assistant to Professor Webster, Clark University, 1906-07.
- WILLIS L. GARD, A. B., Elkhart, Indiana
Fellow in Psychology 3 Charlotte St.
A. B., Indiana University, 1896; Fellow in Psychology, Clark University 1906-07.
- JAMES WILLIAM HARRIS, A. B., Lexington, Kentucky
Fellow in Psychology 78 Florence St.
A. B., Union College, Barboursville, Ky., 1901; Scholar in Psychology, Clark University, 1905-06; Fellow, 1906-07.
- EUCLID HELIE, A. B., Grand Ligne, Quebec
Fellow in Psychology 5 Lowell St.
A. B., McMaster University, Toronto, Canada, 1905; Scholar in Psychology, Clark University, 1905-06; Fellow, 1906-07.
- KYUGORO ISHIZAWA, A. M., Hobara, Japan
Fellow in Economics 46 Woodland St.
Graduate, Waseda University, 1898, LL. B., Chyuo University, 1900; A. M., State University of Iowa, 1904; A. M., University of Wisconsin, 1907.
- JUNICHIRO KINOSHITA, A. M., Tokio, Japan
Fellow in Economics 46 Woodland St.
Graduate, Doshisha College, 1892; Meiji University (Law), 1899; A. M. Yale University, 1907.
- OLAF K. LIE, Richmond, Massachusetts
Fellow in Mathematics 242 Chandler St.
Graduate, Cadet-School, Kristiania, 1884; Fellow in Mathematics, Clark University, 1905-07.
- C. ALLAN LYFORD, A. M.
Fellow in Chemistry 87 Woodland St.
B. S., Worcester Polytechnic Institute, 1903; Fellow in Biology, Clark University, 1903-05; Scholar in Chemistry, 1905-06; A. M., Clark University, 1906; Honorary Scholar, 1906-07; Assistant in Biology and Chemistry, Clark College, 1904-05; Assistant in Chemistry, 1905-07; Assistant in Geology, Feb. 1908-.
- MAURICE WALTER MEYERHARDT
Fellow in Psychology 5 Clayton St.
Student at Koellnisches Gymnasium, Berlin, seven years; Special Student in Psychology, Clark University, 1903-04; Scholar, 1904-07.
- NEWTON MILLER, A. M., Thorntown, Indiana
Fellow in Biology 78 Florence St.
A. B., Indiana University, 1905; A. M., 1906; Fellow in Biology, Clark University, 1906-07.

- GEORGE ORDAHL, A. M., Eugene, Oregon
Fellow in Psychology 81 Florence St.
B. S., Valparaiso College, 1899; A. B., University of Oregon, 1905; A. M., 1906; Fellow in Pedagogy, Clark University, 1906-07.
- WILLIAM L. PRAGER, M. S., New York, New York
Fellow in Chemistry 1 Benefit St.
B. S., College of the City of New York, 1900; M. S., New York University, 1904; Tutor in Mathematics, College of the City of New York, 1902-1907; Tutor in Chemistry, *ibid.*, 1907- .
- EUGENE C. ROWE, A. B., Mt. Pleasant, Michigan
Fellow in Psychology 80 Woodland St.
A. B., Olivet College, 1897; Head of Department of Psychology and Education, State Normal School, Mt. Pleasant, Mich., 1901- .
- HERMON L. SLOBIN, A. B.
Fellow in Mathematics 3 Blake St.
A. B., Clark College, 1905; Scholar in Mathematics, Clark University, 1905-06; Fellow, 1906-07.
- JUN WATANABE, A. M., Tokio, Japan
Fellow in Economics 14 Lowell St.
Graduate, Keiogizuku (College) University, 1905; Scholar in Economics, Clark University, 1906-07; A. M., Clark University, 1907.
- EDWARD E. WEAVER, A. M., Catonsville, Maryland
Fellow in Psychology 6 Hancock St.
A. B., University of Wooster, 1885; A. M., Princeton University, 1889; Graduate, Princeton Theological Seminary, 1889.
- JESSE HAYES WHITE, A. M., Alamo, Indiana
Fellow in Psychology 18 Gates St.
A. B., Indiana University, 1903; A. M., 1904; Assistant in Experimental Psychology, *ibid.*, 1903-04; Fellow in Psychology, Clark University, 1906-07.
- EDWARD M. ARNOS, B. S., Archbold, Ohio
Scholar in Economics 9 Gates St.
B. S., Lima College, 1907.
- CHARLES W. BACON, A. M., North Oxford, Massachusetts
Scholar in Chemistry
A. B., Clark College, 1906; Scholar in Chemistry, Clark University, 1906-07; A. M., Clark University, 1907; Assistant in Chemistry, Clark College, 1907- .
- WILLIAM JAMES BEESON, M. S., Jacksonville, Alabama
Scholar in Psychology 44 Abbott St.
B. S., Alabama Polytechnic Institute, 1896; M. S., 1897; Principal of State Agricultural School, Blountsville, Ala., 1897-99; Professor of English and History, State Normal School, Jacksonville, Ala., 1899-1905; Meridian (Miss.) Male College, 1905-06.
- FLOYD E. CHIDESTER, Ph. B., Newark Valley, New York
Scholar in Biology 24 Beaver St.
Ph. B., Syracuse University, 1907; Assistant in Biology, *ibid.*, 1906-07.

- CHARLES W. COBB, A. M., Newton Centre, Massachusetts
 Scholar in Mathematics 21 Shirley St.
 A. B., Amherst College, 1897; A. M., 1901; Graduate Student in Psychology,
 Amherst College, 1897-98; Science of Education, Columbia and New York
 Universities, 1904-05.
- ELNORA WHITMAN CURTIS, A. B.
 Scholar in Psychology Burncoat St.
 A. B., Smith College, 1892.
- ROLLAND RAWSON GREENWOOD, A. B.
 Scholar in Psychology 21 Merrick St.
 A. B., Clark College, 1907.
- SAKYO KANDA, Tokyo, Japan
 Scholar in Psychology 44 Woodland St.
 Graduate, Kansei Gakuin, 1900.
- FRANCIS P. McNAMARA, A. B.
 Scholar in Psychology 5 Suffield St.
 A. B., College of the Holy Cross, 1907.
- WILLIAM J. MONTGOMERY, A. B.
 Scholar in Mathematics 14 Lewis St.
 A. B., Clark College, 1907.
- RAYMOND KURTZ MORLEY, A. M.
 Scholar in Mathematics 46 Abbott St.
 A. B. and A. M., Tufts College, 1904; Instructor in Mathematics, University
 of Maine, 1904-1907.
- MARGARET MORSE, A. B., Amherst, Massachusetts
 Scholar in Biology 23 Maywood St.
 A. B., Mount Holyoke College, 1906.
- X JOHN A. MUNSON, A. M.
 Scholar in Psychology 89 Summer St.
 A. B., Central University of Iowa, 1891; A. M., University of Michigan,
 1894; Instructor in Modern Languages, Central University of Iowa, 1890-93;
 Vincennes University, 1895-96; Syracuse University, 1903; Massachusetts
 Agricultural College, Feb., 1908-.
- JAMES A. RUSSELL, A. B.
 Scholar in Pedagogy 3 Taylor St.
 A. B., College of the Holy Cross, 1907.
- WILLIAM G. SIDDELL, A. B.
 Scholar in Psychology 24 Beaver St.
 A. B., Syracuse University, 1902; Special Student in Psychology, Clark
 University, 1906-07.
- GEORGE HENRY STEVES, A. B., Onsted, Michigan
 Scholar in Psychology 24 Beaver St.
 A. B., University of Michigan, 1905.

X Ph.D., June 1909 as J. A. Magni

EDITH M. WALLACE, A. B., Nashua, New Hampshire
 Scholar in Biology 23 Maywood St.
 A. B., Mount Holyoke College, 1903; Instructor in Biology, Western College for Women, Ohio, 1904-06.

SPECIAL STUDENTS

JOHN MERRICK BEMIS, M. D.
 Student in Psychiatry Herbert Hall Hospital
 M. D., University of Vermont, 1893.

WINIFRED S. BIVIN
 Student in Psychology 15 Charlotte St.

ROBERT JOHN FLOODY, S. T. B.
 Student in Psychology 43 Endicott St.
 Graduate, Teachers Training School, Ont., Can., 1882; B. S., Albion College, 1890; M. S., 1894; S. T. B., Boston University, 1894; Student in Philosophy, Clark University, 1904-06; Honorary Scholar, 1906-07.

NELLIE MANN OPDALE, Marlboro, Massachusetts
 Student in Psychology

EDWARD B. SAUNDERS, A. B., Fitchburg, Massachusetts
 Student in Psychology
 B. D., St. Lawrence University, 1900; A. B., 1904; Special Student in Psychology, Clark University, 1906-07.

NORA JENNINGS SWEENEY
 Student in Psychiatry Herbert Hall Hospital

HENRY BRADFORD WASHBURN, B. D.
 Student in Psychology 42 Elm St.
 A. B., Harvard University, 1891; B. D., Episcopal Theological School, Cambridge, 1894; Temporary Instructor in Church History, *ibid.*, 1901-02.

INMAN L. WILLCOX, A. M.
 Student in Philosophy 138 Elm St.
 A. B., Hamilton College, 1886; A. M., Harvard University, 1900; Student, Andover Theological Seminary, 1886-1889; Scholar in Psychology, Clark University, 1901-02; Student, 1902-07.

ATTENDANTS UPON SATURDAY COURSES

| | |
|---------------------|-----------|
| O. H. ADAMS | Leicester |
| OLIVER R. COOK | Worcester |
| MINNIE E. DOHERTY | Worcester |
| G. MILTON FISHER | Westboro |
| JOHN M. GALLAGHER | Worcester |
| ALICE LOUISE HARRIS | Worcester |
| DOROTHY D. KEYES | Worcester |

MAURICE J. LACEY
BIEYAO TSANCHI LEE
ANNIE P. PURDY
HELEN NILES ROWE
ETTA SINSABAUGH

Worcester
Worcester
Dodge
Worcester
Leicester

FLORENCE CHANDLER
Clerk of the University and Acting Bursar

52 Woodland St.

ADMINISTRATION

The trustees are the ultimate source of authority in all matters pertaining to the University. They act collectively, through committees, and also through the president of the University.

DUTIES OF THE PRESIDENT OF THE UNIVERSITY

The duties of this office were defined by the Trustees, May 23, 1889, as follows:

The President of the University shall consult frequently with the Trustees on all matters which concern the welfare of the University, and attend the meetings of the Board. He shall confer with each instructor concerning the development of his department, determine the duties and authority of each, and preside at the meetings of the Faculty. He shall be the authorized medium of communication between the Board of Trustees and the officers of instruction, individually and collectively, in all matters involving the administration of the University. The enactments of the Board concerning instructors and their work, and all requests, complaints and proposals from the Faculty to the Trustees shall be made known through him. He shall exercise or provide such superintendence over buildings, apparatus, books and other property, as will secure their protection and appropriate use. Expenditures

must not be ordered by any instructor of the University without his previous consent or the express authority of the Board.

These duties were more fully defined by By-Laws enacted by the Corporation Sept. 26, 1889. These are as follows:

BY-LAWS

1. The President of the University shall preside on all public academic occasions, shall direct the official correspondence, study the wants and interests of the whole University and exercise a general superintendence over all its concerns. His first care, and that of the authorities of the University, shall be the departments already established, and next those closely related to them; but no other department shall be established until those already introduced have been brought to the highest state of efficiency then possible. All acts, however, which shall involve the expenditure of money in the administration of the University's affairs, shall be subject to the approval of the Board of Trustees or the Finance Committee for the time being.

2. As the efficiency of a University depends chiefly upon the quality of its Faculty, the Board of Trustees will hold the President to a strict but reasonable accountability for the fidelity and ability of each instructor. The President only shall have the power to select and appoint all officers of instruction, subject to the approval of the Board of Trustees. To make wise and well-considered appointments, to maintain harmony within the Faculty, and to increase their efficiency in research and instruction shall be his most important duty. If at any time the President shall be negligent in the dis-

charge of these or other duties, or is from any cause disabled from discharging them, they may be exercised by the Board of Trustees.

3. The President of the University shall be the medium of communication between the Trustees and Instructors, individually and collectively, upon all matters within the field of action of either body. He shall attend all meetings of the Board of Trustees, of which he shall be notified, and shall participate in their deliberations, but without the power to vote. All complaints and requests from members of one body to the other shall be made through him.

4. The President shall call and preside over all official meetings of the Instructors, and a record of their proceedings shall be kept. These records are in no case to be made known to others than the Trustees. They shall always be in the custody of the President, but may be inspected by the Trustees, or either of them, at any time.

5. The President of the University, in the absence of the Trustees or Finance Committee, shall have the entire direction and control of the persons employed about the University and not engaged in the work of instruction; the duties of all such persons shall be assigned and they shall be appointed or removed by him, subject to the approval of the Finance Committee.

6. No instructor shall order any books or apparatus, or anything connected with the work of instruction (beyond his appropriation), without the approval of the President. No expense for the care of buildings or grounds, nor for alterations or repairs within and upon the same shall be made without the approval of the Board of Trustees or the Finance Committee, such altera-

tions or repairs in no case to exceed the appropriations made for that purpose. If the Trustees, or Finance Committee, or any person shall make contracts in behalf of the University without authority, the officer or person making such contract shall become individually responsible therefor.

7. The officers of instruction shall be appointed for a term of from one to five years. At the end of this period the work of each instructor will be subjected to a careful scrutiny upon the results of which his reappointment shall depend, always provided, however, that any Instructor will be liable to be discharged at any time for incapacity, neglect of duty, or for such other cause as shall seem good to the Trustees.

8. Each Instructor shall give stated lectures to however few. He shall actively and zealously strive to maintain the highest possible standard, shall work in a spirit of hearty sympathy and co-operation, and shall encourage research by precept and, if possible, by example.

9. The foregoing By-Laws are intended to embody the provisions contained in a vote passed by the corporation on the twenty-third day of May, A. D. 1889, upon the motion of Judge Devens. (See above.) If at any time hereafter any discrepancy shall be found to exist between the two, said By-Laws shall be so far modified as to conform to the provisions of said vote.

10. No instructor shall engage in any outside professional or technical pursuit without the approval of the Board, the Finance Committee, or the President.

11. These By-Laws, or any one of them, may be changed, amended, or repealed by a vote of three-fourths at least of the Trustees at any meeting of their Board duly called, notified, and held for that purpose.

GENERAL STATEMENTS

The University now consists of nine departments, in which all its work and that of Instructors, Fellows and Scholars is grouped.

These departments are as follows :

- I. MATHEMATICS
- II. PHYSICS
- III. CHEMISTRY
- IV. BIOLOGY
- V. ANTHROPOLOGY
- VI. PSYCHOLOGY
- VII. PEDAGOGY
- VIII. ECONOMICS AND SOCIOLOGY
- IX. HISTORY

THE FACULTY

The Faculty elect Fellows and take action upon general requirements for the Doctor's and Master's degrees and other promotions, act and advise upon whatever may be officially submitted to them by the Board or by the President, and consider all matters not otherwise provided for and in which all departments of the University are alike interested.

ADMISSION

Only graduate students or those of equivalent attainments are admitted to full membership in the University, except in rare and special cases.

At present no entrance examinations are required; but by testimonials, diplomas, personal interviews, or written specimens of work, the authorities must be satisfied that the applicants have scholarship enough to work to advantage, and zeal and ability enough to devote themselves to their chosen field. The methods of the University are too costly, and its energy and funds too precious, to be spent upon those who are not well trained, promising and in earnest.

It is highly desirable that candidates entering any of the nine departments, shall have, besides a knowledge of the other subjects commonly taught in colleges, a reading knowledge of French and German.

For the select students who are received, it is the purpose of the University to open all its privileges and to supply every incentive possible in the way of books, facilities, and, above all, direct personal stimulus. The chief as well as the best work of this University is individual, and involves daily suggestion, encouragement and direction. The limited number of students permits more or less personal instruction in each case.

CLASSES OF APPOINTEES

No clearly marked line exists between students and instructors. Fellows who have attained some degree of mastery in a special line of work sometimes give brief special courses, which may be attended by professors. This is a stimulus to the student, and both tests and exhibits power in teaching.

I. DOCENTS

The highest annual appointment not involving membership in the Faculty is that of Docent. These positions are primarily honors, and are reserved for the few whose work has already marked a distinct advance beyond the Doctorate and who wish to engage in research. Docents are not assistants, and their relations are directly with the President of the University.

Docents may be provided with individual rooms and special apparatus may be purchased for their work, if desired and approved. While they will be expected to deliver a limited number of lectures on some special chapter of their department, their time will be mainly reserved for study and research in a way best adapted to qualify them still more fully for academic advancement.

These positions are official appointments made by the Faculty upon nomination of the head of the department and on the following conditions:

1. The candidate must have received the degree of Ph. D. at least one year before he can enter upon the duties of Docentship.

2. That year must have been spent in research and the candidate must have given evidence of his skill and capacity as a teacher by giving a course of lectures, by assisting in the regular work of instruction in this or some other institution of university rank, or in some other satisfactory manner.

3. The candidate must prepare and read in public an habilitation address approved as such by the chief instructor in his department.

4. If these conditions are fulfilled he will receive at the close of his address a diploma granting him the *venia docendi* for the following year in this University and formally attesting his fitness as both scholar and teacher for an academic chair.

5. The fee for this diploma shall be \$25, which in case of need the Faculty shall have power to remit.

A memoir or essay representing original work in the department, but no examination, is required. This highest formal academic honor will

be strictly reserved for those of marked scientific attainment and teaching ability and, so far as this diploma can have the significance of a title or degree, it will be regarded by the University as a brevet collegiate professorship.

It is believed that the difficulties under which college trustees sometimes succumb in selecting suitable professors may be diminished by the existence of such a select body of scholars of guaranteed scientific training, ability and approved power to teach, and that otherwise this new grade will aid in raising the standard of academic scholarship in colleges and in encouraging scientific research here. Appointees of this class may be paid a small salary.

II. LECTURERS

Those who have already taken the degree of Doctor of Philosophy or who are under appointment as Fellows may, on recommendation of the head of the department, be designated to give a number of lectures upon topics in which they have attained special competency.

III. HONORARY FELLOWS

Those who have already advanced to the Doctor's degree may be appointed Honorary Fellows and given the privileges of the University, in-

cluding those of the Library. In past years many who have already taken this degree, either in this country or abroad, and who are awaiting academic appointment, have found these positions both helpful for their own further research and development and also advantageous for obtaining the collegiate and university appointments that they seek.

IV. CANDIDATES FOR THE DEGREE OF DOCTOR OF PHILOSOPHY

Candidates for the Doctor's degree must have previously taken the Degree of Bachelor of Arts or have had a substantial equivalent for the training implied by that degree.

At least one, but in most cases three, years of graduate work are necessary for this degree. Examinations for it, however, may be taken at any time during the academic year when, in the judgment of the University authorities, the candidate is prepared, provided the requirement of one year's residence has been absolved.

For this degree one requirement is a dissertation upon an approved subject, to which it must be an original contribution of value. To this capital importance is attached. It must be reported on in writing by the chief instructor before the examination, printed at the expense of the

candidate, and at least one hundred copies given to the University. However, in case of a dissertation of unusual length, or containing expensive plates, the Faculty shall have power, at the request of the candidate, to reduce this number of presentation copies to fifty.

Such formal or informal tests as the Faculty may determine shall mark the acceptance of each student or Fellow as a candidate for this degree. One object of this preliminary test shall be to insure a good reading knowledge of French and German. Such formal candidature shall precede the examination itself by a period prescribed in the special rules below.

The fee for the Doctor's degree is \$25, payable before the examination. The presentation copies of the dissertation must be in the hands of the Librarian before the diploma is delivered. In exceptional cases, and by special action of the Faculty, the act of promotion may precede the presentation of the printed copies of the dissertation.

An oral, but no written, examination is required upon at least one minor subject in addition to the major before an examining jury composed of at least four members, including the head of the department and the President of the University, who is authorized to invite any

person from within or without the University to be present and to ask questions. The jury shall report the results of the examination to the Faculty, who will recommend satisfactory candidates for the degree.

For the bestowal of this degree, the approbation of the Board of Trustees must in each case be obtained by their signature upon the diploma. They desire that the standard of requirements for it be kept the highest practicable, that it be reserved for those of superior ability and attainment only, and that its value be never suffered to depreciate.

It is to the needs of candidates for this degree that the lectures, seminaries, laboratories, collections of books, apparatus, etc., are especially shaped, and no pains will be spared to afford them every needed stimulus and opportunity. It is for them that the Fellowships and Scholarships are primarily intended, although any of these honors may be awarded to others.

On November 14th, 1900, the following vote was passed by the Board of Trustees:

That the University will admit candidates for the degree of Doctor of Philosophy and will confer that degree without regard to sex.

SPECIAL RULES CONCERNING THE DOCTOR'S DEGREE

I. *Residence.* No candidate shall receive the degree of Doctor of Philosophy without at least one academic year's previous residence.

II. *Candidature for the Doctor's Degree.* Every applicant for the Doctor's degree shall fill out, before October fifteenth, the regular application blank provided at the office. This schedule shall be submitted to the head of the department. Before affixing his signature he shall satisfy himself, in such manner as he may desire, as to the fitness of the applicant.

III. When countersigned, this schedule shall be filed with the President, and the applicant will be examined in French and German by the annual Committee for that purpose.

IV. In case of a favorable report by this committee, the applicant shall be a regular candidate for the degree.

V. Candidates complying with all preliminary conditions, including the examinations in French and German, before November first will be allowed to proceed to the doctor's examination at any time between May fifteenth following and the end of the academic year.

VI. *The Doctor's Dissertation.* The dissertation must be presented to the instructor under

whose direction it is written, and reported upon by him before the doctor's examination. In every case the dissertation shall be laid before the jury of examination, at the time of examination, in form suitable for publication. This provision shall not, however, preclude the making of such minor changes later as the chief instructor may approve.

VII. The dissertation shall be printed at the expense of the candidate and the required copies deposited with the Librarian within one calendar year after the first of October following the examination. The candidate alone will be held responsible for the fulfilment of these conditions.

VIII. The favorable report of the chief instructor, filed in writing with the Clerk of the University, shall be a sufficient imprimatur or authorization for printing as a dissertation. The printed copies shall bear upon the cover and title page the statement of approval in the following words, over the signature of the chief instructor:

A Dissertation submitted to the Faculty of Clark University, Worcester, Mass., in partial fulfilment of the requirements for the degree of Doctor of Philosophy, and accepted on the recommendation of

(NAME OF CHIEF INSTRUCTOR.)

IX. *Examinations for the Doctor's Degree.* The examinations for the doctor's degree may be held at any time during the academic year, pro-

vided that at least one academic year has elapsed since the completion of the preliminaries of candidature, except in the case of fulfilment of these conditions between the beginning of any academic year and November first of that year, to which case Rule V applies. The examinations shall be held at such hours and places as the President may appoint.

X. Examinations may also be held during the regular vacations of the University, but for these an additional fee of five dollars to each examiner and the reasonable travelling expenses of any examiners who are out of town, all payable in advance, will be required.

V. DEGREE OF MASTER OF ARTS

This degree is conferred upon candidates who comply with the following requirements:

1. The candidate shall have previously taken the degree of Bachelor of Arts, or have had a substantial equivalent for the training implied by that degree, to be determined by special vote of the Faculty; but such degree or training must involve a good preparation for the work proposed for the Master's degree, in order that it may be accepted.

2. The candidate must devote a full academic year to post-graduate work in this University

after receiving the Bachelor's degree or the training accepted as its equivalent. This work shall be mainly in one department, but the candidate may do also such other work as shall be advised by the head of his principal department,—whose approval of the whole course shall be necessary. In particular cases, the candidate may be allowed, by special vote of the Faculty, to divide his work between two years; but the aggregate must, in all cases, amount to a full year's work, at least.

3. The candidate must satisfy the representatives of his principal department that he has done his work faithfully, and has mastered the subjects involved, by such written and oral examinations and other tests as the department may require. The head of the department shall make a written report to the Faculty of the grounds on which the candidate is recommended, specifying the amount and character of his work; and this report shall be filed in the office.

4. The candidate must present a thesis or written report on some topic included in his course or closely related to it, that shall receive the approval of the representatives of his principal department, be accepted by the Faculty, and filed in the office.

5. Every candidate recommended for the Master's degree shall pay a fee of ten dollars.

6. The Master's degree will be conferred at the annual commencement in June of any year on those candidates only who shall have made written application to be considered as such on or before January 15th preceding and shall have fulfilled all the conditions here specified at least one week before Commencement, at which time the academic year shall be regarded as ending for the purposes of section 2.

VI. SPECIAL STUDENTS NOT CANDIDATES FOR A DEGREE

Any one desiring to undertake a special and approved line of research, and whose attainments are such as to satisfy the requirements of the University, may also be received. This class includes persons who may desire to devote themselves exclusively to one or more of the special branches—mathematics, physics, chemistry, biology, anthropology, psychology, pedagogy, economics and sociology, or history,—but who do not care to matriculate or become candidates for a degree.

These students, provided they satisfy the heads of the departments of their training and competency in one subject, in which they must be advanced (although they may be less so, or even beginners, in other subjects), may be allowed en-

tire freedom in their choice and combination of studies, and as special students may enjoy all the privileges of the University.

These students may, with the approval of the President, be received for less than an entire year.

VII. PRELIMINARY CANDIDATES

Non-university students of less special or less advanced standing than the above classes, who contemplate becoming candidates for some higher degree, may also be received.

Students of this class must satisfy the authorities of the University of their attainments and that they contemplate advancing to a degree higher than that of A. B. The privileges and status of these students will be more fully defined later. They may, in exceptional cases, be elected to Scholarships.

FELLOWSHIPS AND SCHOLARSHIPS

From the George F. Hoar Fund of \$100,000 provided by the generosity of Andrew Carnegie, the sum of \$3,000 is now available for Junior and Senior Fellowships in the University. While the sums attached to these appointments are not fixed, a Senior Fellow may receive \$200 together with the remission of fees, which makes the value of the appointment \$300. A Junior Fel-

low may receive \$100 with remission of fees, which makes the value of the appointment \$200. Besides these, other appointments of Senior and Junior University Scholarships, with remission of fees, are made.

A CITIZEN'S FUND

A citizen of Worcester has given a fund of \$5,000, the income of which is to be used for the aid of "some one or more worthy native born citizens of the city of Worcester who may desire to avail themselves of the advantages of the institution."

THE FIELD FUND

Mrs. Eliza W. Field has also given \$500 to be called the "John White Field Fund," the income of which is "to provide for the minor needs of a Scholar or Fellow."

The following regulations apply to the award of the income of the Field Fund:

1. Regard is had to the intellectual ability of the candidate as well as to need of pecuniary assistance.

2. Only candidates who have spent three months at the University are considered.

3. The head of each department will consider and report to the Faculty desirable cases in his department.

4. Applications are received not later than December 15th, and the awards made as soon as possible after the Christmas recess.

THE ELIZA D. DODGE FUND

Mrs. Dodge has given \$1,000 to be known as the "Eliza D. Dodge Fund," the income only to be expended in aid of graduate students of limited means engaged in research work.

PURPOSE AND CONDITIONS OF FELLOWSHIPS AND SCHOLARSHIPS

Fellowships at Clark University are intended for young men and women of promise who desire to pursue post-graduate studies in order to fit themselves for intellectual careers. It is desirable, but not required, that candidates for these positions should intend to proceed to the degree of Doctor of Philosophy or to equivalent attainments. In general, those intending to devote themselves to some special branch of learning are preferred to those directly fitting themselves for one of the three learned professions, although the latter are not excluded.

No application blanks are provided, but it is desired that the candidate should state fully and in writing his previous course of study and submit testimonials or diplomas, especially such as

indicate a decided preference for some particular department. These should also, if practicable, be accompanied by some specimen of the candidate's work. Applications will be considered in May and in October and should be in the hands of the President on or before the first day of either month. In special cases vacancies may be filled by appointments at any time during the year. The names of unsuccessful candidates will not be made public.

Fellows must reside in Worcester during the entire academic year, devote themselves to special studies under the direction of their instructors, and give such evidence of progress or proficiency before the end of the year as the authorities shall require. It is generally expected that they will undertake some work of research during the year. They must co-operate in promoting harmony, order, and all the ends of the University, must not teach elsewhere, and may be reappointed at the end of the year. Being intended primarily as honors, both Fellowships and Scholarships are awarded without reference to pecuniary needs, so that those able and desiring to do so may relinquish the emolument and retain the title of "Scholar" or "Fellow."

The paying fellowships will, for the present, be restricted to the departments of mathematics,

physics, chemistry, biology, psychology, pedagogy, and economics.

METHODS

Besides field work, excursions to institutions (public and private), coaching and cram classes, clubs, examinations and other modes by which knowledge now seems best imparted and retained, the following educational methods are prominent:

LECTURES. The Trustees desire that each instructor, of however few students, should prepare and deliver regular lecture courses, with diagrams, illustrative apparatus, and reference to standard text-books and the best current literature upon each topic. Advanced students are also encouraged to supplement the work of the professors by giving occasional special lectures and courses. Public lectures will be given from time to time.

SEMINARIES AND CONFERENCES. These are stated meetings for joint systematic work, under the personal direction of the professor, in some special part of his subject. Here students preparing theses and other papers for publication in the journals edited at the University read them in incomplete form for mutual criticism and help. Here, also, the results of individual read-

ing are reported for the benefit of all; views are freely criticised; new inquiries, methods, comparisons, standpoints, etc., suggested. From the mutual stimulus thus given many important works have proceeded and the efficiency of universities has been greatly increased.

LABORATORY WORK. For beginners this has been from the first the best of all forms of apprenticeship, bringing student and professor to a closer and mutually stimulating relation. Here the manipulation of apparatus is learned, processes are criticised, results obtained by other investigators are tested, and methods discussed and perfected, with a view to developing that independence in research which is the consummation of scientific culture.

NOTICES

The charge for tuition, giving all the privileges of the University, but not covering the laboratory fees, is \$100 per annum.

Board and lodging can be obtained near the University at very moderate rates.

Intending students will be given information, so far as possible, upon any of these or other points, in advance of official announcement, upon addressing the Clerk of the University, Miss Florence Chandler, Worcester, Mass.

All members of the University are expected to be present at the opening of each term and to continue in attendance to its close.

The following are the statements and announcements of the departments for the academic year, 1908-1909.

I

MATHEMATICS

PROGRAMME FOR 1908-1909

INSTRUCTION IN MATHEMATICS

The chief aim of the department is to make independent investigators of such students as have mathematical taste and ability; these naturally look forward to careers as teachers of the higher mathematics in colleges and universities, and we believe that the course of training best adapted to the development of investigators is also that which is most suitable for all who would be efficient college professors, even if they are not ambitious to engage in research. The first essential of success in either of these lines is the habit of mathematical thought, and the direct object of our instruction is the acquisition of this habit by each of our students. With this end in view, we expect every student to make himself familiar with the general methods and most salient results of a large number of different branches of mathematics, conversant with the detailed results and the literature of a few branches, and thorough master of at least one special topic to the extent of making a real contribution to our knowledge of that subject.

In accordance with these principles, the instruction is given by means of introductory, advanced, and special courses of lectures, seminars, and personal guidance in reading and investigation.

The introductory courses (mostly given in alternate years) treat the following subjects:

ANALYTIC GEOMETRY OF HIGHER PLANE CURVES, HIGHER SURFACES, AND TWISTED CURVES; 5 hours a week, through the year.

DIFFERENTIAL EQUATIONS, AND CALCULUS OF VARIATIONS; 5 hours a week, through the year.

THEORY OF FUNCTIONS OF REAL AND IMAGINARY VARIABLES, ELLIPTIC FUNCTIONS, AND DEFINITE INTEGRALS; 5 hours a week, through the year.

THEORY OF NUMBERS; 2 hours a week, one half-year.

MODERN SYNTHETIC GEOMETRY; 2 hours a week, one half-year.

ALGEBRAIC SUBSTITUTIONS AND THEIR APPLICATION TO THE THEORY OF EQUATIONS; 2 hours a week, one half-year.

ALGEBRAIC INVARIANTS; 2 hours a week, one half-year.

FINITE DIFFERENCES; 2 hours a week, one half-year.

It is expected that every student will take each course in the earliest year of his residence in which it is given, unless he has already completed an equivalent course elsewhere. The chief object of these courses is to make the student familiar with the various methods of mathematical research and the concepts of mathematical thought at the present day. Thus, for example, curves and surfaces are treated by modern methods from the beginning, with adequate consideration of the discoveries of the great geometers of recent times. The usual college courses in the theory of algebraic equations, analytic geometry, and the differential and integral calculus furnish all the necessary preparation for these introductory courses, although it is very desirable that the student be acquainted with the properties of determinants and their application to the solution of linear equations, and with the methods of solving differential equations of the simpler types. Deficiencies in these

subjects may be made up by attendance on the corresponding courses in the Collegiate Department of the University.

A Seminary will be conducted in connection with the introductory courses, in which the students will be exercised in individual investigation and the oral presentation of results. The literature of the topics discussed will here receive adequate attention.

Special advanced courses, open to such as have nearly or quite completed the introductory courses, are given annually in subjects varying with the interests of the instructors and the needs of the students.

Each advanced student is placed under the supervision of one of the instructors for guidance in the original investigation of some special topic; the successful issue of this investigation may furnish material for the dissertation required of a candidate for the degree of Doctor of Philosophy.

For the academic year 1908-1909, the following courses are offered

BY PROFESSOR STORY

SEMINARY FOR ADVANCED STUDENTS; through the year.

Introductory courses :

ANALYTIC GEOMETRY OF HIGHER PLANE CURVES, HIGHER SURFACES, AND TWISTED CURVES ; 5 hours a week, through the year.

FINITE DIFFERENCES ; 2 hours a week, through the year.

Advanced courses :

HISTORY OF MATHEMATICS ; 2 hours a week, first half-year.

RESTRICTED SYSTEMS OF ALGEBRAIC EQUATIONS ; 2 hours a week, second half-year.

BY PROFESSOR TABER

Introductory Course :

THEORY OF FUNCTIONS OF REAL AND IMAGINARY VARIABLES, ELLIPTIC FUNCTIONS, AND DEFINITE INTEGRALS; 5 hours a week, through the year.

Advanced Course :

PICARD-VESSIOT THEORY OF LINEAR HOMOGENEOUS DIFFERENTIAL EQUATIONS; 2 hours a week, through the year.

SEMINARY, through the year.

By PROFESSOR WEBSTER

[See announcement of Department of Physics, courses 10, 11, 13, 14.]

By M. DE PEROTT

Introductory Courses:

THEORY OF NUMBERS; 2 hours a week, first half-year.

ABELIAN INTEGRALS; 2 hours a week, second half-year.

During the academic years 1889-1908, advanced and special courses have been given in :

1. THE HISTORY OF MATHEMATICS among various peoples from the earliest times to A. D. 1650.
2. THEORY OF NUMBERS.
3. LINEAR TRANSFORMATIONS AND ALGEBRAIC INVARIANTS, with applications to algebraic equations and geometry.
4. THEORY OF SUBSTITUTIONS, with applications to algebraic equations.
5. PLANE ANALYTIC GEOMETRY.
6. SOLID ANALYTIC GEOMETRY.
7. HYPERSPACE AND NON-EUCLIDEAN GEOMETRY.
8. ENUMERATIVE GEOMETRY.
9. QUATERNIONS, with applications to geometry and mechanics.
10. MULTIPLE ALGEBRA, including matrices, quaternions, the "Ausdehnungslehre," and extensive algebra in general.
11. MODERN SYNTHETIC GEOMETRY.

12. THEORY OF FUNCTIONS according to Cauchy, Riemann, and Weirstrass, with applications.
13. WEIRSTRASS'S THEORY OF ELLIPTIC FUNCTIONS.
14. ABELIAN FUNCTIONS AND INTEGRALS.
15. NUMERICAL COMPUTATIONS.
16. THEORY OF QUADRATIC FORMS.
17. ANALYSIS SITUS, particularly the connectedness of surfaces and map-coloring.
18. SURFACES OF THE THIRD AND FOURTH ORDERS (analytically treated).
19. PLANE CURVES OF THE THIRD AND FOURTH ORDERS (analytically treated).
20. KLEIN'S ICOSAEDRON-THEORY.
21. ELLIPTIC MODULAR FUNCTIONS.
22. THETA-FUNCTIONS OF THREE AND FOUR VARIABLES.
23. RIEMANN'S THEORY OF HYPERELLIPTIC INTEGRALS.
24. SYMBOLIC LOGIC.
25. TWISTED CURVES AND DEVELOPABLE SURFACES (torses).
26. RATIONAL AND UNIFORM TRANSFORMATIONS OF CURVES AND SURFACES.
27. THEORY OF FUNCTIONS OF A REAL VARIABLE.
28. DEFINITE INTEGRALS AND FOURIER'S SERIES.
29. ORDINARY DIFFERENTIAL EQUATIONS, including differential equations with infinitesimal transformations, general theory of linear differential equations, Gauss's, Legendre's and Bessel's functions.
30. PARTIAL DIFFERENTIAL EQUATIONS, including Laplace's, Bessel's, and Lamé's functions.
31. FINITE DIFFERENCES AND PROBABILITIES.
32. APPLICATIONS OF THE INFINITESIMAL CALCULUS TO THE THEORY OF SURFACES.
33. SIMULTANEOUS EQUATIONS, including Restricted Systems.
34. THEORY OF TRANSFORMATION GROUPS.
35. THE APPLICATION OF TRANSFORMATION GROUPS TO DIFFERENTIAL EQUATIONS.
36. THEORY OF ERRORS.

The advanced and special courses are not repeated at regular intervals, but properly prepared students will

receive the personal assistance of one or other of the instructors in reading any subject not announced for the year in which they desire to take it.

The number and scope of the advanced courses given each year have been, thus far, regulated by the number of students qualified to profit by them and by the individual interests of the instructors; these courses will be increased, both in number and variety, whenever a real demand for such an increase shall make itself apparent. While the present purely scientific character of the University precludes instruction in strictly technical branches, we hope that the time is not far distant when the demand shall make it advisable, and increased facilities shall make it possible, to announce courses in Descriptive Geometry, Graphical Statics, Mathematical Astronomy, Vital Probabilities, and all the more important applications of mathematics to other sciences and to technical subjects. The applications of mathematics to physics already receive adequate consideration, and the further extension of such applications awaits only a demand for it on the part of students.

Each year seminaries for the training of students in methods of investigation are conducted by the several instructors, and those who have attained the necessary proficiency are personally directed in individual researches, of which the results are published in various mathematical journals.

The degree of Doctor of Philosophy is conferred upon such students as have completed all the introductory courses and a satisfactory number of advanced and special courses, have presented approved memoirs embodying the results of original investigation, and have passed creditable examinations in their principal depart-

ment of study and in one subordinate department. Mathematical students are generally advised to offer theoretical physics as their subordinate subject, and facilities are given for acquiring the requisite knowledge of this subject during their first or second year at the University.¹ Three years of University work are ordinarily necessary to obtain the degree.

Every facility for the study of special branches will be given to properly prepared students who are not candidates for the doctor's degree, and to those who, having already taken the degree (here or elsewhere), wish to continue mathematical study or investigation.

MATERIAL FACILITIES

The library is provided with the more important textbooks, treatises, and memoirs on the various branches of mathematics, as well as the principal journals and transactions of learned societies that are devoted to any considerable extent to mathematics. Among the periodicals are the following :

Acta mathematica. Stockholm, Berlin and Paris, 1882 to date. Complete.

American association for the advancement of Science. Proceedings, 1848 to date. Complete.

American journal of mathematics. Baltimore, 1878 to date. Complete.

American Mathematical Society.

Bulletin. 1894 to date. Complete.

Transactions. 1900 to date. Complete.

Amsterdam. Koninklijke akademie van wetenschappen. Verhandelingen, 1854 to date. Complete.

¹ For requirements see p. 54.

Annali di mathematica, pura ed applicata. Milano, 1889 to date.

Annals of mathematics. 1884 to date. Complete.

Archiv der mathematik und physik. 1901 to date.

Berlin. Königlich-preussische akademie der wissenschaften. Mathematische und naturwissenschaftliche mittheilungen aus den sitzungsberichten. 1882-97. Complete.

Berliner mathematische gesellschaft. Sitzungsberichten. 1902 to date. Complete.

Bibliotheca mathematica. Stockholm, Berlin and Paris, 1884 to date. Complete.

Bologna, Istituto di. Reale academia delle scienze.

Commentarii. 1731-1791. Complete.

Novi commentarii. 1834-1849.

Memorie fis. e mat. 1806-1810.

Memorie. 1850 to date. Complete.

Boston. American academy of arts and sciences. Proceedings, 1878-95.

British association for the advancement of science. Report. 1831 to date. Complete.

Brussels. Académie royale des sciences des lettres et des beaux-arts de Belgique.

Bulletins. Ser. 3. 1889 to date.

Mémoires couronnés et mémoires des savants étrangers. 1889-90.

Bulletin des sciences, mathématiques et astronomiques. 1870 to date. Complete.

Cambridge philosophical society.

Proceedings. 1843 to date. Complete.

Transactions. 1822 to date. Complete.

Colorado, University of. Studies. 1902 to date. Complete.

Deutsche mathematiker-vereinigung. Jahresbericht. Leipzig, 1890 to date. Complete.

Edinburgh philosophical journal. 1819-1826.

Edinburgh. Royal Society. Transactions. 1783 to date. Complete.

Fortschritte der mathematik, Jahrbuch über die. Berlin, 1868 to date. Complete.

France, Société mathématique de. Bulletin. Paris, 1873 to date. Complete.

Göttingen. Königliche gesellschaft der wissenschaften. Nachrichten von der k. gesellschaft der wissenschaften und der Georg-Augusts-universität. 1853 to date.

Haarlem. Hollandsche maatschappij der wetenschappen. Archives néerlandaises des sciences exactes et naturelles. 1866 to date. Complete.

International catalogue of scientific literature. 1902 to date. Complete.

Internationale mathematiker-kongress. Verhandlungen. 1897 to date. Complete.

Journal de mathématiques pures et appliquées. Paris, 1836 to date. Complete.

Journal für die reine und angewandte mathematik. Berlin, 1826 to date. Complete.

Leipzig. Königlich-sächsische gesellschaft der wissenschaften.

Berichte über die verhandlungen der mathematisch-physischen classe. 1849 to date. Complete.

Abhandlungen der mathematisch-physischen classe. 1852 to date. Complete.

Liège. Société royale des sciences. Mémoires. 1843 to date. Complete.

London mathematical society. Proceedings. 1865 to date. Complete.

London. Royal society.

Proceedings. 1800 to date. Complete.

Philosophical transactions. 1665 to date. Complete.

Mathematische annalen. Leipzig, 1869 to date. Complete.

Messenger of mathematics. Oxford, Cambridge and Dublin. 1862 to date. Complete.

Milan. Reale istituto lombardo di scienze e lettere.

Classe di scienze matematiche e naturali. Rendiconti. 1864-67. Complete.

Rendiconti. 1868 to date. Complete.

Memorie. 1843 to date. Complete.

Monatshefte für mathematik u. physik. Wien, 1908.

New York mathematical society. Bulletin. 1891-94. Complete.

Nouvelles annales de mathématiques. Paris, 1842 to date. Complete.

Paris. Institut de France. Académie des sciences. Comptes rendus hebdomadaires des séances. 1835 to date. Complete.

Paris. Annales scientifiques de l'école normale supérieure. 1864 to date. Complete.

Paris. École polytechnique. Journal. 1794 to date. Complete.

Philosophical magazine. London, Edinburgh and Dublin, 1798 to date. Complete.

Quarterly journal of pure and applied mathematics. London, 1857 to date. Complete.

Revue semestrielle des publications mathématiques, rédigée sous les auspices de la société mathématique d'Amsterdam, 1893 to date. Complete.

Rome. Reale accademia dei lincei. Atti. Rendiconti.

Tokyo. Mathematico-physical society. Proceedings (Tôkyô sôgaku-buturigakkwai kizi) 2d Ser., 1901 to date. Complete.

Vienna. Kaiserliche akademie der wissenschaften. Sitzungsberichte der mathematisch-naturwissenschaftlichen classe. 1848 to date. Complete.

Zeitschrift für mathematik und physik. Leipzig, 1856 to date. Complete.

Zeitschrift für mathematische und naturwissenschaftliche unterricht. 1903 to date.

The department possesses a set of Brill's admirable models (wanting only those published during the last few years, which will be obtained as soon as possible) and Björlings thread models of developable surfaces.

The department possesses also:

An Amsler Planimeter (with revolving table), and a Thomas Arithmometer.

II

PHYSICS

Professor Webster will deliver the following lectures. In order to meet the convenience of students, and to prevent the necessity of waiting for the logical beginning of the cycle, the regular courses are repeated with a cycle of two years. These embrace the subjects that are indispensable, and the pursuit of them will fit the student to read and study any memoirs on mathematical physics. The courses are so arranged that, although they follow in order, it is possible for a student to begin in either year of the cycle. The regular courses are not marked with a star, and constitute a course of from five to seven hours weekly. The starred courses are delivered at irregular intervals, according to the demands, or the presence of students of sufficient advancement.

LECTURES

1. DYNAMICS. GENERAL PRINCIPLES, EQUATIONS OF LAGRANGE AND HAMILTON, METHODS OF HAMILTON AND JACOBI, SYSTEMS OF PARTICLES, RIGID BODIES.

This course is fundamental for the pursuit of all the others, and includes a detailed account of the principle of Least Action and the differential equations of Lagrange, preparatory to their application to other parts of mathematical physics such as optics and electricity.

2. NEWTONIAN AND LOGARITHMIC POTENTIAL FUNCTIONS, ATTRACTION OF ELLIPSOIDS.

This course is a necessary preliminary to the study of electricity and magnetism, of hydrodynamics, and of the figure of the earth.

3. ELASTICITY, HYDRODYNAMICS, WAVE AND VORTEX MOTION, DYNAMICAL BASIS OF SOUND AND LIGHT.

This course is the basis of applications of the theory of wave motion to sound, light, electro-magnetism, and earthquake waves, and to the study of meteorology.

3a*. DYNAMICS OF CYCLIC AND OSCILLATORY SYSTEMS, WITH APPLICATIONS TO THE THEORY OF ELECTRICITY, SOUND AND LIGHT.

The substance of the preceding courses is contained in Professor Webster's Treatise on Dynamics. B. G. Teubner, Leipzig.

3b*. THE THEORY OF RESONANCE WITH APPLICATIONS TO THE MEASUREMENT OF SOUND AND TO WIRELESS TELEGRAPHY.

This course takes up Professor Webster's original researches in acoustics, and also shows how the methods there employed bear on the fundamental electrical phenomena involved in wireless-telegraphy.

4. ELECTRICITY AND MAGNETISM. THE CLASSICAL THEORIES AND THE THEORY OF MAXWELL, WITH AN ACCOUNT OF THE PRINCIPAL METHODS FOR THE SOLUTION OF PROBLEMS, AND APPLICATIONS TO ABSOLUTE MEASUREMENTS.

The substance of this course is found in Professor Webster's Mathematical Treatise on the Theory of Electricity and Magnetism. London, Macmillan & Co.

4a*. RECENT DEVELOPMENTS IN ELECTRICAL THEORY, INCLUDING THE THEORY OF LORENTZ.

The application to the theory of Electrons, and to the optics of bodies in motion.

5. THE THEORY OF LIGHT. PROPAGATION OF LIGHT, DIFFRACTION, REFLECTION AND REFRACTION, DISPERSION, DOUBLE REFRACTION, POLARIZATION, METALLIC REFLECTION, MAGNETO-OPTICS.

5a. COMPARISON OF THEORIES OF THE ETHER.

Critical and historical examination of the various mechanical explanations of the luminiferous ether, including those of Green, McCullagh, Kelvin, Maxwell, Sommerfeld and Lamor.

5b*. GEOMETRICAL OPTICS. PROPERTIES OF SYSTEMS OF

RAYS, AND THEIR VARIOUS ABERRATIONS. HAMILTON'S CHARACTERISTIC FUNCTION OR EIKONAL. APPLICATIONS TO OPTICAL INSTRUMENTS.

6. THERMODYNAMICS. THERMO-AND ELECTRO-CHEMISTRY.

The establishment of the two laws of Thermodynamics, and their application, by means of the methods of Gibbs and Helmholtz, to the examination of physical and chemical phenomena. Application to heat-engines, including steam, gas, and oil engines, the flow of gases and vapors, and the steam turbine. The conditions of chemical equilibrium, phenomena of electrolysis, osmotic pressure, and capillarity.

7. THE KINETIC THEORY OF GASES. THE MAXWELL-BOLTZMANN THEOREM AND THE ELEMENTS OF STATISTICAL MECHANICS.

8*. THE THEORY OF RADIATION AND OF A BLACK BODY.

The relations obtained from the laws of Kirchhoff, Stefan, Wien, and Planck, by the recent application of Thermodynamics.

9*. THE PHENOMENA OF CONDUCTION OF ELECTRICITY IN GASES, AND OF RADIOACTIVITY, AND THEIR BEARING ON THE STRUCTURE OF THE ATOM.

10. THE PARTIAL DIFFERENTIAL EQUATIONS OF MATHEMATICAL PHYSICS.

Laplace's Equation, Equation of Thermal and Electrical conduction, Equation of Wave-motion, Helmholtz's Equation, Beltrami-Lorentz Equation, Telegrapher's Equation, and their special cases; methods of Cauchy, Green and Riemann; Developments in Series, Fourier's Series, Legendre's, Laplace's, Bessel's and Lamé's functions.

This course is one of the most important for the physicist, and treats a great variety of subjects from the most varied fields, grouping them all into a connected system, and embracing all the methods of theoretical physics.

11*. THE ELEMENTS OF INTEGRAL EQUATIONS, AND THEIR APPLICATION TO MATHEMATICAL PHYSICS.

12*. SELECTED CHAPTERS IN THE APPLICATION OF THEORETICAL PHYSICS TO COSMICAL PHENOMENA, INCLUDING PROBLEMS IN GEODESY, THE TIDES, METEOROLOGY, SEISMOLOGY, AND TERRESTRIAL MAGNETISM.

13*. LINEAR DIFFERENTIAL EQUATIONS.

The applications of the theory of functions to the linear differential equations (ordinary) which arise in mathematical physics.

14*. ORTHOGONAL SURFACES AND CURVILINEAR COORDINATES, AND THEIR APPLICATIONS.

The courses for 1908-9 will be 1, 2, 3, 4. During the past year 4a, 5a, 5b, 6, 7, 10, 11 have been given.

In addition to the above formal courses there is held a weekly Colloquium, or meeting for the informal discussion of subjects not treated in the lectures, and for the presentation by the students of reports on important articles appearing in the journals. A part of the work of the colloquium consists in the systematic presentation of certain classical researches, more or less connected with the lectures, in preparing which the students make use of the original sources of information, thus gaining much acquaintance with the methods of the masters in research. The work of the colloquium has an excellent effect in training students to present their ideas in a systematic manner before an auditory.

The facilities without which no graduate department of research in pure and applied physics can be complete are comprised under three heads: first, a systematic course of lectures in theoretical or mathematical physics; second, a laboratory with a sufficient number of rooms for individual work and with a sufficient equipment of apparatus and an instrument shop for the speedy production of whatever may be necessary for the research in hand; third, a library containing the classic works on physics, with full sets of journals by which the history of progress, past and present, may be studied, and kept up to date by the continual purchase of the latest works. In all these directions the facilities offered by this department invite attention.

Among the various lines of investigation now attracting the attention of the physicists the following are preeminent in importance. First, the interrelations between the luminiferous ether and ordinary matter, and

the modifications necessary to be made in Maxwell's theory in order to explain the known optical and electrical phenomena of bodies in motion, and that aspect of the theory which deals with the properties of the small electric bodies known as electrons. This portion of mathematical physics has hardly begun to appear in university courses in this country. Second, the structure of the atoms of matter, to which the subjects of spectroscopy and the new and fascinating field of radioactivity give the most promising clew. Third, the thermodynamics of radiation in general, which is most intimately connected with the first, and of which a similar remark may be made as to the lack of instruction.

Of branches of applied physics now awaiting the attention of the mathematical physicist may be mentioned meteorology, seismology, and geophysics in general, in all of which the accumulation of experimental data is ahead of the development of theory, to such an extent in meteorology that Professor Arthur Schuster has said that it would be advisable to suspend all meteorological observations for the next ten years, until the theory should have in some degree caught up with the mass of information already accumulated. The theory of meteorology depends on complicated applications of hydrodynamics and thermodynamics, so as to make great demands upon the mathematical physicist, but the field is a rich one to him possessed of the skill to cultivate it. The study of earthquake phenomena is one that is now becoming of great importance in this country, while the investigation of terrestrial magnetism has lately made great advances.

It is almost obvious to the trained investigator that no one can expect to become a physicist of the first

rank without a thorough training in mathematical physics, as without that the results of experiment will never be collected into a coherent system worthy the name of an exact science. Furthermore all mathematical physics must rest upon mechanics, the principles of which are of an importance transcending that of any other branch of natural science. It is for this reason that the courses in physics in this department begin with mechanics, and are developed progressively in a systematic manner. They have the advantage of having been deliberately planned for the needs of students of pure physics, as experience has shown them to be prepared by the various colleges, and of being all delivered by the same person, so that logical consistency and continuity of method are assured. The waste of time often incurred by repetitions of the same subject and of changes of notation by various instructors is thus totally avoided. Attention is called to the fact that no branch of physics is left unprovided for in the course of lectures.

The aim of the department is to insure in its students some acquaintance with all the various fields of experimental physics, to develop in them the power of exact measurement, to accustom them to exact reasoning from experiment to theory, and to encourage original research conducted on a sound basis. To this end students will be put to work in the laboratory upon experiments of sufficient difficulty to give them skill in measurements of precision, and to enable them to become familiar with the precautions and corrections necessary to be employed in exact work. After a sufficient amount of experience has been gained, and the student has shown himself to be possessed of sufficient originality to war-

rant independent investigation, he will be encouraged to take up for himself an original research in the hope of making a personal contribution to science. In this research he will have at all times the benefit of the direction and advice of the professor.

It should be urged upon intending students to prepare themselves, not only in ordinary laboratory measurements, but also in mathematics, the lack of proper mathematical preparation being a serious drawback to the appreciation of the lectures. In particular may be recommended for study not merely those portions of the calculus which deal with the working out of many indefinite integrals, etc., but the theoretical portions which deal with the ideas of partial derivatives, definite integrals, and their practical manipulation, together with enough analytic geometry to involve the properties of lines and *surfaces* of the second order, and a fair amount of the elements of determinants. As suitable textbooks for preparation may be recommended to the student Lamb's, Osgood's or Gibson's Calculus, C. Smith's Analytical Geometries, and Muir's or Hanus's Determinants. Appell, *Éléments de l'analyse mathématique*, may be very strongly recommended to the intending student for study before and during his course at the University.

It cannot be too strongly urged that the student should, from the beginning, be able to read French and German with ease and to make use of works in them.

REQUIREMENTS FOR THE DOCTOR'S DEGREE

1. The ability to read at sight specimens of scientific French and German, tested before the first of November preceding the doctor's examination by a committee of two members of the Faculty.

2. The successful passing of an examination upon the general subject of Experimental Physics¹ and upon the subjects named above in the regular course in Theoretical Physics, as a major requirement, together with an examination in one minor subject, to be determined in each particular case by the head of the Physical Department. This subject will be Mathematics or Chemistry.

3. The presentation of a satisfactory dissertation, involving a substantial amount of original work, and forming a contribution of value to pure science. The presentation of the dissertation is a prerequisite to examination.

The time of residence necessary for the proper fulfilment of the above requirements will generally be at least three years, of which at least one will be very largely devoted to work on the dissertation. Students will not be encouraged to enter upon the work of a dissertation until they have acquired sufficient experience to enable them to specialize with advantage.

The aim of the department is to produce physicists rather than electricians, acousticians, opticians, engineers, or narrow specialists of any sort, for although in the nature of things one will be obliged to know more of one subject than of others, yet it seems evident that no thorough knowledge of any branch can be gained without a comprehensive view over the whole subject. Without this the specialist, or the experimentalist lacking a knowledge of mathematics, will continually be falling into pitfalls which the more wary avoid. Furthermore it can be but a detriment to science to encourage research in new fields by immature and ill-prepared minds and hands.

The following statement is here inserted for the benefit of students of mathematics.

The minor in Mathematical Physics consists of the subject-matter of courses 1, 2, 3 and 10, which are intended to constitute the equivalent of five hours a week for one year. Course 10 is given in alternate years to the other courses. The subject-matter of the course is

¹ Every student is recommended to provide himself with Winkelmann's *Handbuch der Physik* as a work for continual reference.

contained in Dr. Webster's treatise on *Dynamics* and Riemann-Weber's *Partielle Differentialgleichungen*.

THE LABORATORY

The laboratory occupies three floors of one wing of a large well lighted building free from disturbances, and admirably adapted to the purposes of a physical laboratory. On the ground floor is a room extending across the end of the building, forty-five feet long by twenty-two feet wide, with windows on three sides, above which are three similar rooms. A lift running from the bottom to the top floor affords a means of transporting apparatus, while its shaft furnishes space for manometer or barometer tubes. In the lower room are four piers with heavy stone tops, and two others below the floor on which can be placed heavy tables.

The other rooms on the ground floor are a large dark room, partially below ground, in which the temperature is tolerably constant, containing a very large and heavy pier. The engine and storage-battery room contains a kerosene engine and dynamo on the same foundation, and sixty storage cells of ten amperes capacity, constituting the power-supply. The engine may be started at a few moment's notice, even at night. The storage cells are conveniently arranged so that each one is accessible from each side, from above and below, and the ventilation is excellent, while the room is as light and clean as the work-rooms. Distributing switchboards allow the current from the dynamo or any section of the battery to be supplied to any of the rooms. On the same floor are three rooms constituting the workshop, one of the most important parts of a research department

of physics. The first room is devoted to wood-working and pattern-making, and accommodates also a bench for soldering. The next room contains the machinist's bench, two engine-lathes and planer, and the third room a Rivet precision bench-lathe, jeweller's lathe and drill-press. There is no countershafting in the building, each tool being driven by a separate electric motor, while the capacity of the battery is such that for ordinary purposes it is not necessary to drive the engine for the shop alone, so that perfect quiet and steadiness are ensured. In the shop are executed all repairs and alterations of apparatus, and the new apparatus requiring continual experiment is constructed. Most of the principal pieces of apparatus belonging to this department have been thus constructed. In this manner, by having a mechanic always present, an extremely great economy in time and money is effected, and vexatious delays, which would otherwise completely arrest the progress of the work, are avoided. Facilities and encouragement are given to the students to construct apparatus for themselves.

On the main floor are the lecture room, the director's office, the large room used as the director's private laboratory and apparatus room, and three other convenient rooms for research. Two of these are arranged so that they may be darkened for photography, and are also fitted with chemical hoods. The large room on the top floor is devoted to the Rowland twenty-foot diffraction grating, and has a photographic dark room attached. There has been constructed during the current year a storage-battery of two thousand small cells for researches requiring a constant source of high potential, such as a research in canal rays now in progress.

This battery is conveniently housed next to the grating room. Every room in the laboratory contains sinks, gas and electric light connections, and several circuits connecting with the switchboard in the battery-room.

The laboratory is well equipped with apparatus for research, besides having the facilities above described for the construction of instruments of any sort needed for that purpose. In addition may be mentioned a large collection of diagrams illustrative of mathematical physics, many of them being originals of the figures in Professor Webster's "Electricity and Magnetism" and "Dynamics," and a number of interesting models used in teaching dynamics, thermodynamics, and electricity. Among them are Maxwell's Dynamical Top and a number of other interesting tops, Rayleigh's induction model, Gibbs's, van der Waals's and other thermodynamical surfaces. This collection of drawings and models can probably not be matched in this country, and is continually being increased.

The laboratory affords so much space that it is rarely necessary to put more than one student in a single room. Every student receives personal attention in the laboratory from the professor whenever he needs it, and is continually in receipt of instruction and suggestion by personal contact, the best form in which information can be imparted. Emphasis should be laid on the advantage to the research student of the contact with a professor who has no other duties or interests than the furtherance of research, in an institution devoted to this as its main object.

THE LIBRARY

In the library Clark University has one of its strongest features. With a large separate building, administered in the most liberal manner with a view to the advantage of the research student, and with ample funds for the purchase of books, its facilities in the Department of Physics can hardly be surpassed. It may be said to contain all of the most important works in many languages, and is continually kept up to date, any book wanted needing only to be mentioned to be procured. The library is particularly rich in journals, among which are included the transactions of the learned societies of England, France, Germany, Italy, Austria, Holland, and Belgium. Other sets are being continually added. There are few subjects connected with physics which may not be thoroughly studied in this library.

The following works may be mentioned :

Collected Writings of Helmholtz, Hertz, Clausius, Kirchhoff, Kelvin, Lorentz, Gibbs, Green, Hopkinson, McCullagh, Joule, Stokes, Maxwell, Rankine, Rayleigh, Regnault, Reynolds, Rowland, Rumford, Tait, Young, Gauss, Fourier, Leplace, Cauchy, Foucault, Fresnel.

Potential, Electricity and Magnetism. Riemann, Betti, Dirichlet, Korn, Mathieu, Somoff, Kirchhoff, Neumann, Minchin, Routh, Clausius, Duhem, Maxwell, Boltzmann, Drude, Mascart and Joubert, Wallentin, Watson and Burbury, Webster, Gray, Heaviside, Thomson, Poincaré.

Elasticity. Mathieu, Ibbetson, Love, Todhunter and Pearson, Williamson, Clebsch, Neumann, Lamé, Boussinesq, Résal, Poincaré.

Hydrodynamics. Bassett, Lamb, Kirchhoff, Neumann, Poincaré, Wien.

Light. Mascart, Kirchhoff, Helmholtz, Neumann, Wood, Volkmann, Drude, Résal, Poincaré, Bassett, Curry, Preston, Maclaurin, Schuster, Walker.

Heat. Clausius, Helmholtz, Kirchhoff, Planck, Rühlmann, Boltzmann, Voigt, Zeuner, Bertrand, Duhem, Poincaré, Preston, Weinstein.

Sound. Rayleigh, Donkin.

A large number of treatises on Mechanics, a set of the *Travaux et Mémoires du Comité International de Poids et Mesures*, and of the published memoirs of the *Physikalisch-technische Reichsanstalt*, may also be mentioned.

Among the journals are complete sets of the

Annalen der Physik und Chemie.

Annales de Chimie et de Physique.

Bulletin of the Bureau of Standards.

Comptes Rendus.

Eclairage Electrique.

Journal of Physical Chemistry.

Nature.

Philosophical Magazine.

Philosophical Transactions.

Physical Review.

Physikalische Zeitschrift.

Proceedings of the Royal Society.

Science.

Science Abstracts.

Zeitschrift für Instrumentenkunde.

The library subscribes to the following journals also :

American Journal of Science.

Annalen der Physik.

Beiblätter zu den Annalen der Physik.

Electrical World.

Electrician.

Elektrotechnische Zeitschrift.

Fortschritte der Physik.

Jahrbuch für Elektronik.

Journal de Physique.

Le Radium.

Il Nuovo Cimento.

III

CHEMISTRY

The aim of the department is to equip students for original work in Chemistry. Such equipment, consisting in a clear knowledge of the principles and methods of the science, is believed to be best for the industrial chemist as well as for the collegiate teacher. The teacher of chemistry who is unable to contribute a share to the growth of his science will teach the dead letter of some text-book and can hardly impart to his students a practical knowledge of natural phenomena. And in the opinion of leaders of the great chemical industries in Europe, a young industrial chemist, too, is best equipped, not if he has acquired necessarily unpractical information in the chemistry of the manufactures, but if he has obtained clear critical knowledge of the principles of pure chemical science and some experience in grappling with difficulties. The desire for such knowledge, and the courage and perseverance necessary in attacking problems are acquired only through research.

The work of the department will be conducted with these principles in view and will be adjusted to the needs of the students from year to year. Advanced students will be expected to spend most of their time on research work. However, specialized courses on topics of history of chemistry, chemical dynamics, heterogeneous equilibria, stereo-chemistry, electro- and thermo-chemistry, applications of thermodynamics to chemistry, etc., will be offered, and the students will

be expected to attend them regularly. Each topic will be approached, not as a chapter in a book but as a problem in nature. It will be introduced by an estimate of its importance and of its bearing on other problems. Then an account will be given, on the historical plan as far as possible, of the extent to which the problem has been solved, of how this was done, and of how much is not yet solved, with suggestions as to practical methods by which solution might be obtained. It is believed that such form of study, much more than the "advanced" nature of the subjects studied, is the true characteristic of university work.

To aid students not quite prepared for work of this kind lecture and laboratory courses will be offered in general inorganic and organic chemistry, organic synthesis and analysis, physical chemistry, etc. The time required for such students to qualify for the degree of Doctor of Philosophy will depend in each case upon the proficiency of the student. Residence for one year is required, and three years will not be too long for most graduates. A working knowledge of analytical geometry and the calculus will be pre-supposed in all the work of the department.

The research work conducted in the department will be mainly along the following lines: 1. Experimental and theoretical study of the deviations of fact from the accepted principles of general chemistry; 2. Experimental study of organic substances and reactions from the standpoint of chemical statics and dynamics. Of course, promising investigations may be taken up, from time to time, along other lines as well.

REQUIREMENTS FOR THE DOCTOR'S DEGREE

1. A good reading knowledge of both German and French, which the student ought to acquire as early as possible.
2. The presentation of a dissertation which in the opinion of the head of the department will form a valuable contribution, either theoretical or experimental, to chemical science.
3. The passing of an examination in the several branches of chemistry, including modern physical chemistry, chemical statics and chemical dynamics, and in one minor subject, to be determined in each case by the head of the Chemical Department.

COURSES OFFERED DURING THE YEAR 1907-08

A. *Professor Rosanoff's Courses*

1. Physical and Theoretical Chemistry. Mondays and Thursdays at 9 A. M.
2. Organic Stereo-chemistry. Tuesdays at 9 A. M.

B. *Dr. Merigold's Course*

Thermo- and Electro-chemistry. Fridays at 9 A. M.

In addition to these, Dr. J. C. Hubbard, of the Department of Physics, is giving lectures and laboratory instruction, Friday afternoons, in Electro-chemical Measurements.

During the present year the energy of the students is concentrated on their research work, and it seemed unnecessary and undesirable to offer more numerous courses.

FACILITIES

The University laboratories occupy a considerable part of the chemical building, and the storerooms contain an unusually large collection of organic preparations, besides all the ordinary inorganic chemicals. The collection of physico-chemical apparatus is sufficient for most purposes. Each of the more advanced students is given a private laboratory with a complete outfit for his work.

The Library contains complete files of all the more important chemical journals in English, German, and French. The collection of general works, monographs and reference books is being rapidly enlarged. All books specially needed are purchased at once.

It is believed that the facilities for serious research offered by the department are in many ways exceptional. Information regarding fellowships and scholarships is given elsewhere.

IV

BIOLOGY

PROGRAMME FOR YEAR 1908-1909

Dr. Hodge will offer the following courses :

I. DYNAMIC BIOLOGY AND GENERAL PHYSIOLOGY. It is proposed to combine in this course the fundamental laws and principles of biological science, the emphasis being placed on the functional or dynamic side rather than on the side of morphological structure. In other words, the point of view of the course is that living species have assumed certain forms and have developed definite structures in order to fit them to perform a certain work in the economy of nature. The first half-year is devoted to the study of a typical series of animals as forces in nature, special attention being directed to methods and apparatus by which dynamics of species may be investigated. On the side of biological theory, which occupies the last half of the year, among others the following topics will serve to outline the scope of the course. Origin and constitution of living matter. Physiological functions. Classification of plants and animals. Biological reactions, tropisms, experimental morphology. Differentiation of organs. Growth and reproduction. Heredity. Variation. Specialization. Evolution. One lecture weekly, October to June. Laboratory work will be arranged to meet the needs of individual students.

II. BIOLOGICAL EDUCATION. The University stratum—history, aims and methods of biological research. The College level—outlines of college courses and history of their development. Biology in the high school. Biological nature study for the elementary schools. Eight lectures during October and November.

III. A biological seminary will be held one evening weekly throughout the year. In general the work of this seminary is planned to run on a three-year cycle as follows: first year,

history of science and of biological research; second year, philosophy and historical development of evolution; third year, the laws of heredity and variation. The year 1908-1909 will be the third year of the cycle.

NEUROLOGY

It is intended to arrange the course in such a manner that the general field may be covered in two years, This will leave the student free to devote his entire time during the third year to special study in the literature of the science and to the prosecution and completion of his thesis work. Accordingly, a two-year cycle will be arranged as follows :

IV. COMPARATIVE STUDY OF NERVOUS SYSTEMS AND SENSE ORGANS. This course will form the natural basis for comparative psychology and together with the working out of a minor problem may well constitute a minor for one whose major is psychology or philosophy. On the biological side it will be closely correlated with general physiology and morphology. It is intended to begin with a comparative study of the structural elements of the nervous system of both invertebrates and vertebrates and then correlate and compare the different degrees of complexity of function with the anatomical organization found in the ascending series. The course will be illustrated throughout by diagrams, models, dissections and microscopical preparations and experiments. Laboratory work one afternoon weekly, or arranged to meet the needs of individual students. One hour weekly for general class exercise, or its equivalent.

V. THE HUMAN NERVOUS SYSTEM AND SENSE ORGANS. This course will deal with the anatomy, both gross and microscopic, and with the physiology and hygiene—fatigue and sleep, growth and development, localization—of the brain. One hour weekly, or the equivalent. Laboratory one afternoon a week, or arranged to meet the needs of individual students.¹

¹ For elementary courses in special physiology, histology and hygiene refer to announcement of biological courses in the Collegiate Department.

By way of supplementing the above and courses in other departments of the University, two special courses have been planned as follows :

VI. PRACTICAL HISTOLOGY. The course will be a laboratory course, with such lectures, directions and conferences as may be required by those taking it. It will be arranged practically to meet the needs of individual students. Considerable latitude will be given, so that any who wish may make it a comparative study by way of supplementing course I, prepare a series of demonstrational specimens for themselves, or devote their time to special problems.

VII. For those who do not take work in the laboratory, but desire to see the actual specimens and experiments, a course of demonstrations to run somewhat parallel with the above courses will be offered. One hour weekly, through the year.

EXPERIMENTAL WORK

Laboratory work in biology, physiology, histology, and neurology is arranged to meet the needs of individual students. Its general purpose is to facilitate practical familiarity with methods of research, and as soon as practicable each student is expected to begin an original investigation. Standard apparatus of most improved types is at the disposal of the laboratory, and when new work requires specially devised apparatus, every effort within the means of the department is made to obtain it. The aim of the laboratory is thus to place at the disposal of those interested in the solution of physiological and neurological problems the best obtainable facilities for the prosecution of their work. In case one has not decided on a special line of research, the resources of the department are such that he will be given a fairly wide range of problems from which he may select a subject suited to his tastes and attainments. A course in biology such as is given in our

best colleges and State universities is sufficient to enable students to begin work here.

A long-felt need of the department is now supplied in the possession of land well adapted and conveniently located for biological research. Ideal facilities can now be offered for the study of daily rhythms, lives and work of species under natural conditions; and also for experiments in animal and plant breeding. It is proposed to organize an extended series of researches upon the effects of different chemical substances and conditions of life upon the viability and vigor of the germ plasm.

While no regular laboratory fees are charged, each student is expected to refund to the laboratory the cost price of all the more expensive reagents, including alcohol, ether, chloroform, formalin, celloidin, and the like. Each student must supply his own microscopical glass, slides and covers, and must pay the cost price of all glassware that he breaks. All students are expected to take the best possible care of all apparatus entrusted to their charge, and to return it to the laboratory clean and in good order.

The library of the department has been selected with two important considerations in view. The first of these is to obtain the standard classics in the science. The second is to keep abreast of the times by having the best recent literature readily accessible both for study and reference. This latter class of selections thus includes monographs and text-books and current numbers of journals, with complete files of many of the more important. A complete set of indexes, Jahresberichte and Centralblätter greatly facilitates the work

of referring to the literature of topics under investigation in the laboratory.

THE JOURNAL CLUB meets weekly, for the purpose of reporting and discussing important articles in the current periodicals.

A complete list of the Journals will be found in the *Publications* of the Library.

V

ANTHROPOLOGY

DR. CHAMBERLAIN will lecture twice a week throughout the year. The courses offered will be selected from the following:

A. GENERAL ANTHROPOLOGY, embracing: (a) HISTORY, scope and relations of the science. (b) PHYSICAL ANTHROPOLOGY; problems, investigations, results, laboratory work. (c) ETHNOGRAPHY; races and race-origins. (d) ETHNOLOGY, INCLUDING SOCIOLOGY; origin and development of the arts and sciences, institutions. (e) MYTHOLOGY; folk-lore, religions. (f) LINGUISTICS; race and language, origin and development of language and of languages, psychology of language, gesture-speech and written language, comparative linguistics, comparative literature. (g) CRIMINAL AND PATHOLOGICAL ANTHROPOLOGY; physical and mental, ethnic morals. (h) HISTORICAL AND ARCHÆOLOGICAL; primitive man and primitive culture, the precursors of man.

B. SPECIAL COURSES upon Anthropological Topics most akin to Psychology and Pedagogy, embodying the results of the most recent and important studies and investigations of the following and other subjects, particularly The Characteristics of the Primitive Races and their Rôle in Human History. The Physical Anthropology of Infancy, Childhood, Youth, Manhood, Old Age; the Anthropological Phenomena of Growth, Arrested Development, Degeneration; Anthropological Aspects of Heredity and Environment in the Individual and in the Race; Uncivilized Races and Civilized Races; the Phenomena of Race-Mixture; the Evolution Problems of Humanity; Education among Primitive Peoples; the Anthropological History of America; the Interpretation of Folk-lore; the Psychology of Primitive Peoples; the Trend of Human Progress; the Psychology of Primitive Languages; the Mind of Primitive Man and its Expressions;

the Rôle of the Individual in Primitive Culture; Progress and its Criteria; the Orient and the Occident in their relations to Human Evolution; the Negro in Africa and in America; the American Indian; the Anthropology of Japan and China.

The lectures in Anthropology will have special bearing upon the courses in Psychology and Pedagogy in the University, and every effort will be made to utilize the latest results of Anthropological investigations.

From time to time, the most valuable current literature will be reviewed and students made acquainted with the best contributions to Anthropological Science in the various foreign languages. The importance of a thorough acquaintance with the bibliography of their subjects is impressed upon all students, and all possible assistance in this direction is always at their disposal.

VI

PSYCHOLOGY

A complete course in Psychology at Clark University includes the following subjects:

I. Anatomy and Physiology of the Brain and Spinal Cord, sense organs, and other parts of the body, especially the muscles, the organs of the will, so far as they affect psychological powers and processes, with a good general background of biology. For this a special laboratory is equipped. See Dr. Hodge's announcement.

II. Physiological and Experimental Psychology, including an outline of the anatomy and physiology of the central nervous system, and sense organs; the elementary sense experiences; sensation and perception; the measurement of sensational intensity; space; time; reaction times; feelings and emotions; memory; association; attention; apperception; will; fatigue and rest; sleep; hypnotism; temperament; character; interdependencies of mind and body. For this a special laboratory is equipped. See Dr. Safford's announcements.

III. Comparative and Genetic Psychology. Review of the general doctrine of evolution as a basis for the evolution of mind. Review of experimental and observational studies upon typical forms of animal life beginning with the protozoa. Instincts, animal and human infancy. Childhood and adolescence. See announcements of Dr. Hall and Dr. Sanford.

IV. Abnormal and Morbid Psychology, as nature's experiments, *e. g.*, border-line phenomena as seen in neurotic people, prodigies, and geniuses; defectives, such as the blind, deaf, criminal, idiotic; mental and nervous diseases, epilepsy, phobias, neurasthenia, hysteria; morbid modifications of will, personality and emotion, etc. Special clinical facilities for this work are open to the department in the hospitals and other institutions of the city. See Dr. Hall's lectures and Dr. Cowles lectures and clinic.

V. Anthropological Psychology; myths, custom and belief, comparative religion and psychology of religion, primitive art, and the study of the life of savages and children; adolescence and senescence; physical measurements illustrating laws of growth in size and power, etc. See Dr. Chamberlain's courses.

VI. *Æsthetics* and Ethics, the psychology of music, painting, literature, the phenomena and laws of volition and morality.

VII. History of Psychology and Philosophy, including the chief culture institutions, science, medical theories, Christianity, and education generally. Dr. Hall's historical courses and seminary.

VIII. Applications of Psychology, Pedagogy, including mental and moral hygiene and regimen, school organization and methods from kindergarten to university; the sex problem; defectives, etc. Dr. Hall's and Dr. Burnham's courses.

The aim of the Psychological department is to cover this field as well as its instructors are able to do so in two or three years.

THE PSYCHOLOGICAL LABORATORY consists of a suite of twelve rooms on the third floor of the main building, devoted to the following purposes: 1, Departmental Library; 2, Lecture Room; 3, Large Dark Room; 5, Office of Director; 6, Apparatus and preliminary setting up of apparatus; 4, 7, 8 and 9, Rooms for demonstration and research; 10, Shop; 11, Photographic Dark Room; 12, Room for the keeping of animals and for Comparative Psychology. In space and favorable situation the Laboratory leaves little to be desired.

It is also well supplied with apparatus for both demonstration and research, and has access besides to the collections of the physical and biological departments, and that of the psychological department of the College. Many pieces have been manufactured at the University and a considerable number have been designed here for special researches. The collection is

constantly increasing by purchase or construction, especially in apparatus for research.

The Psychological section of the General Library is full on EXPERIMENTAL AND PHYSIOLOGICAL PSYCHOLOGY, and upon THE PSYCHOLOGY OF RELIGION and the STUDY OF CHILDREN. The section on Criminology and related topics is also large. All the more important psychological journals in English, French, German and Italian are received regularly at the University and complete sets of many of these and of the proceedings of learned societies are upon the shelves of the library.

The following courses are announced for the academic year 1908-1909.

DR HALL'S COURSES

Dr. G. Stanley Hall will give the following courses :

I. THE HISTORY OF MODERN PHILOSOPHY. This course will begin with the Patristic Period and trace the evolution of philosophy under the influence of the Church, dealing with scholasticism and then passing to the later history of philosophy in France, England and Germany to contemporary times.

II. THE DEVELOPMENT OF THE MIND IN ANIMALS, PRIMITIVE MAN AND CHILDREN. This course traces the evolution of the psychic functions in the phyletic series up the geological strata and treats comparative psychology from an evolutionary standpoint, dealing with the groups of animals somewhat in the order in which they appeared on the earth. The course is devoted largely to the amplification of the recapitulation theory, but will cover the main lines needed for child study together with its practical application and demonstration of literature upon each topic and the logic and method of various lines of work.

III. THE PSYCHOLOGY OF CHRISTIANITY.

IV. ABNORMAL AND BORDERLINE PSYCHOLOGY: hysteria, epilepsy, psychasthenic states, imperative ideas, anæsthesia, functional paralysis, contractures, convulsions, stigmata, depres-

sion, exaltation, delusions, illusions, hallucinations, popular psychic epidemics, witchcraft, etc.; sex psychology and pathology, hypnotism, suggestion, automatic states, confusion, dreams, somnambulism, dual and multiple personality, troubles of vision, hearing, respiration, alimentation, circulation, aphasia of different kinds, agraphia, dementia præcox, genius, idiocy and imbecility, subnormal states, adolescence and senescence, perversions of the intellect, emotions and will.

V. THE PEDAGOGY OF DIFFERENT SCHOOL TOPICS from the kindergarten to the university, dealing to some extent with the history of education.

VI. SEMINARY, at his home, three hours every Monday evening throughout the year.

VII. RESEARCH with individuals on special subjects.

For all these courses apply for a special circular.

DR. SANFORD'S COURSES

The following courses or their equivalents will be given by Dr. Sanford:

1. *Physiological and Experimental Psychology*. Lectures and demonstrations following in general Wundt's *Grundzüge der physiologischen Psychologie*, portions of which will be assigned for collateral reading. Considerable attention, however, will be paid to the work of other psychologists and especially to the recent literature of the subject. Five hours a week, throughout the year.

2. *Psychological Journal Club*. Reports and discussions upon topics of interest from the current periodicals. Meetings are held at Dr. Sanford's house Saturday evenings throughout the year.

3. *Reading of German psychological texts*. Two hours a week, throughout the year.

4. *Laboratory Practice Course*. Introduction to the use of standard pieces of apparatus and established methods. Informal lectures and laboratory practice. This course is given under Dr. Sanford's direction by a qualified assistant. Four to six hours a week, throughout the year.

5. *Research*. Advanced students are directed in research upon topics in Experimental and Comparative Psychology by Dr.

Sanford. The laboratories are open for advanced work at times suited to the convenience of those engaged in it.

PSYCHIATRY

Dr. Cowles, Lecturer on Psychiatry, former head of the McLean Hospital at Waverly, Mass, will give a course at the University and clinical demonstrations at the Worcester Insane Hospital. Dr. Cowles's course for the year 1907-1908 has included the following topics:

1-2. The dependence of psychiatry upon mental and general physiology; the concept of energy fundamental; the reflex arc and integrative action of the nervous system. Relation of inhibition to anabolism, to external function and katabolism.

3. The physiology and pathology of emotion; depression and exaltation figurative expressions in psychology, both being excitations and katabolic; relations of feeling-tone to conditions of ill-being.

4. Psychasthenia and neurasthenia; the minor psychoneuroses,—psychological automatism, fixed ideas, hysteria.

5. Mental symptoms of nervous exhaustion; their genesis in reductions of functional capacity of the nervous and mental mechanism.

6, 7, 8. The melancholia-mania group of neuropsychoses (not tending to dementia).

DR. COWLES'S lectures are open without fee:

(1) To all members of the Faculty of the University and College;

(1) To all members of the Psychological Department, and to members of the College who are taking other psychological courses in the University.

The fee for all other persons is \$5.00.

VII

PEDAGOGY

This department offers a course which can be taken as a minor for the degree of Doctor of Philosophy. Its work is in the closest connection with that of psychology and anthropology, and in part based on these subjects. The work in this department is intended to meet the needs of the following classes of students.

First. Those intending to teach some other specialty, but who wish a general survey of the history, present state, methods, and recent advances in the field of university, professional and technical education.

Second. Those who desire to become professors of pedagogy, or heads or instructors in normal schools, superintendents, or otherwise to become experts in the work of education.

The programme of the Pedagogical Department includes courses upon the following subjects :

I. (a) CHILD STUDY. (b) PEDAGOGICAL PSYCHOLOGY. (c) EXPERIMENTAL PEDAGOGY. (d) SCHOOL HYGIENE.

II. (a) PRINCIPLES OF EDUCATION. (b) HISTORY OF EDUCATION AND REFORMS. (c) METHODS, DEVICES, APPARATUS, ETC.

III. (a) ORGANIZATION OF SCHOOLS IN DIFFERENT COUNTRIES. (b) THE TEACHING PROFESSION. (c) MOTOR EDUCATION, including manual training, physical education, etc. (d) MORAL AND RELIGIOUS EDUCATION. (e) IDEALS.

The courses in pedagogy for 1908-1909 will be as follows :

DR. BURNHAM'S COURSES

A. THE HYGIENE OF INSTRUCTION. Mental hygiene and the hygiene of instruction. The laws of nervous activity in relation to problems of instruction. Fatigue. The period of study. The hygiene of the kindergarten. The hygiene of spelling, reading, writing, arithmetic, manual training, physical training, etc. The hygienic aspects of grading, of examinations, of discipline, of punishment, etc. One hour a week, throughout the year.

B. THE TEACHING PROFESSION. The essential characteristics of a learned profession. The teacher and the parent. The teacher and the artisan. The teacher in ancient civilization; in China, India, Greece, Rome, etc. The medieval teacher. The teacher of the early Renaissance. The Reformation. The great modern schoolmasters, Sturm, Comenius, F. A. Wolf, Pestalozzi, *et al.* The teaching profession in Germany. The function of the teacher in social evolution. The functions of the teacher in the schoolroom. Characteristics of the teaching profession as a social group. Fundamental Principles concerning the training of teachers. Different plans tried in this and other countries, especially in the training of secondary teachers. The hygiene of teaching. Once a week, half a year.

C. RECENT MOVEMENTS AND PRESENT PROBLEMS IN EDUCATION AND SCHOOL HYGIENE. This course will involve the discussion of special topics and problems of pedagogy, school hygiene, child study, and educational psychology. Topics like the following will be considered from the point of view of genetic psychology and of hygiene:—Correlation. Enrichment of the course of study. Grading. Doctrines of interest. Training of the will. Problems of organization and administration. Recent educational literature. One hour a week, half a year.

D. SEMINARY. The work will be determined in part by the needs of the students who elect this course. It will probably be devoted chiefly to Experimental Pedagogy. It is hoped, also, that each student will select, after consultation with President Hall and Dr. Burnham, a topic for special investigation. The results of such studies may be published. One or two hours a week, throughout the year.

PRESIDENT G. STANLEY HALL'S COURSE

THE PEDAGOGY OF DIFFERENT SCHOOL TOPICS from the kindergarten to the university, dealing to some extent with the history of education.

This and Dr. Burnham's Saturday work constitute a special course open to teachers as well as to members of the University.

The courses as announced above may be modified somewhat as the needs of the students or other circumstances may require.

The library of the department has a large collection of EDUCATIONAL LITERATURE, being especially rich in German and French literature, and having a large number of official reports from various countries—English, French, German, Belgian, Swedish, etc.; also town and city reports, and reports of special institutions; and a collection of French, German, and American text-books.

The books are arranged under the following heads:

1. GENERAL.
2. HISTORY OF EDUCATION.
3. EDUCATIONAL SYSTEMS.
4. THE THEORY OF EDUCATION AND SPECIAL SCHOOL SUBJECTS.
5. EDUCATIONAL PSYCHOLOGY.
6. CHILD STUDY.
7. SCHOOL HYGIENE AND PHYSICAL EDUCATION.
8. TEXT-BOOKS.
9. MISCELLANEOUS.

Many of the more common educational books are accessible in the Worcester Public Library and have not been duplicated by the University. The large collection of educational text-books in the library of the American Antiquarian Society and its valuable historical material are also accessible to the University.

The collection of educational periodicals includes a

large number of the best foreign journals—English, French, German, Swedish, etc.

The nucleus of an educational museum has been formed, which contains a valuable collection of EDUCATIONAL APPARATUS, pictures and other material for language lessons and *Anschauungsunterricht*, maps, charts, diagrams, models, illustrative material in school hygiene, etc.

The *Pedagogical Seminary* is a journal issued at the University, and serves as a convenient medium of publication for special investigations undertaken in the department.

SPECIAL STUDENTS IN EDUCATION

In addition to the members of the University, special students are admitted during the year to the Saturday courses of Drs. Hall and Burnham in Education, for a fee of \$20.

VIII

ECONOMICS AND SOCIOLOGY

The degrees of Master of Arts and Doctor of Philosophy will be offered in this department both in Economics and in Sociology.

The degree of Master of Arts will be given both in Economics and in Sociology for the completion with credit of a course of study approved by the department. Such a course may be composed of a major in Economics and a minor in History, or of a major in Sociology and a minor in Psychology. The requirements, however, will be made sufficiently elastic to suit the needs of individual students.

For the degree of Doctor of Philosophy in either Economics or Sociology, the courses enumerated below, or their equivalents, will be accepted as the major requirement. Students expecting to take the degree in Economics, however, are advised to do their minor work in History; and students expecting to take the degree in Sociology are advised to do their minor work in Psychology, Anthropology, or Biology. The minor work will constitute about one-third of the work required.

The ability of students to do satisfactory research work will always be considered the most important qualification for the Doctor's degree.

Within a period of three years all the following courses will be offered, and each year such courses will

be given as the interests and needs of the students require.

1. Advanced Theory of Economics.
2. History of Economic Theory.
3. Theory and Use of Statistics.
4. Labor Problems, including labor legislation.
5. Theory of Sociology. (See announcement of Collegiate Department.)
6. Literature of Sociology, including the leading theories of the present day.
7. Social Problems, including suicide, divorce, migration of population, fecundity of population, intemperance, pauperism, crime, etc.
8. History of the Theories of Socialism and Communism.
9. Scope and Method of the Social Sciences.
10. Seminary.

For the year 1908-1909 the following courses are offered.

BY PROFESSOR WRIGHT

3. THEORY AND USE OF STATISTICS.

Population: Its composition; Immigration; Arrears, urban and rural; Births; Deaths; Marriages; Divorces.

Statistics of Crime: Pauperism; Benevolences, etc.

Statistics of Agriculture: Commerce; Finance.

Statistics of Manufactures: Capital; Products; Cost of Production; Efficiency of labor; Labor cost, etc.

Wage Statistics: Difficulties attending them; Money wages; Real wages; Cost of living; Rates and earnings; Purchasing power of money.

4. LABOR PROBLEMS.

Under this general title the various features and elements of industrial society will be discussed; including Systems of labor; Evolution of manufactures; The factory system; The regulation of industry by states and individuals; Communism; Municipal socialism; Social democracy and state socialism; Strikes and lockouts; Industrial conciliation and arbitration; Government by injunction; Employers' liability and other features of the labor problem.

10. SEMINARY.

BY DR. BUSHEE

5. **THEORY OF SOCIOLOGY.** (See announcement of Collegiate Department.)

And one or more of the following courses :

1. **ECONOMIC THEORY** during the 18th and 19th Centuries. The theories of the early economists will be studied with reference to the economic conditions under which they were formulated. The major part of the course, however, will be devoted to recent economic literature and to the present trend of economic thought. *2 hours.*

6. **LITERATURE OF SOCIOLOGY.** In this course a critical examination will be made of the contributions of the leading sociologists beginning with Auguste Comte, with reference both to their general theories and to their special contributions to the science of Sociology. Other authors to be studied will include Spencer, Ward, Giddings, Loria, De Greef, Gumplowicz, Coste, Durkheim, Kidd, Tarde, and Simmel. This course presupposes a knowledge of the general principles of Sociology. Those who have not had such preparation may advantageously take the introductory course given in the Collegiate Department. *2 hours.*

7. **SOCIAL PROBLEMS**, including suicide, divorce, migration of population, fecundity of population, intemperance, pauperism, crime, etc.

8. **SOCIALISM AND COMMUNISM.** This course will consist in an historical survey of the theories of the leading Utopian and scientific Socialists and in a critical examination of the practical experiments in Communism which have been made in the United States and in foreign countries. Special attention will be given to the development of the three leading principles of scientific socialism, the materialistic conception of history, the theory of value, and the class conscious struggle. These principles will be studied as represented by Marx, Engels, Kautsky, Bebel, Vandervelde, Labriola, Bernstein, Vollmar, Jaurès, and by the English Fabians. *2 hours.*

10. **SEMINARY IN ECONOMICS AND SOCIOLOGY.** Students entering the Seminary will be directed in research work in topics in Economics or in Sociology. Special subjects outside of the regular courses will be discussed and some of the periodic literature will be reviewed.

IX

HISTORY

Dr. Blakeslee will offer the following courses:

1. CONTEMPORARY HISTORY.

Students who wish to do graduate work in history will be expected to possess a sufficiently broad knowledge of the general field so that they may be able, with intelligent appreciation, to take up the study of special topics. The subjects to which the department will give particular attention are those which have a real importance at the present day. The students may gain the necessary information from the lectures and from extended reading; the preparation of papers, reports, and theses will give the training which will enable them to take up any new historical subject which may challenge public attention, present its important features clearly and accurately, and show its relations to the events and the great world movements of the past.

The subjects recently studied have been: Russia,—political; social, and constitutional development, with emphasis upon the causes and the events of the present revolutionary movement; the Congo Free State, particularly a critical study of the evidence relating to King Leopold's misgovernment; the history of the American Negro and the present Negro problem; the Government of Dependencies, including such topics as Race Psychology and the problems of the social, economic, and religious education of primitive peoples; and the present situation in the Far East, especially Manchuria, Korea, Japan, China, the Philippines and Hawaii.

Each year one of the following courses also will probably be given:

2. INTERNATIONAL LAW.

The aim of this course will be to give a knowledge of the general principles of International Law. So far as possible definite

cases will be studied, and for that purpose Scott's "Cases on International Law" will be followed. Especial attention will be paid to the legal questions involved in the Russian-Japanese controversy; to the history and present status of arbitration; and to the modification in International Law introduced by such international Congresses as those held at the Hague. The study of leading authorities and cases will be supplemented by lectures, discussions and thesis work.

3. **ENGLISH HISTORY**—the Period of the Tudors and the Stuarts.

The course will extend from the accession of Henry VII, in 1485, to the death of Queen Anne, in 1714, and will deal especially with the establishment of practical absolutism under Henry VII and Henry VIII; the rise of Protestantism; the development of Puritanism in State and Church; the great Civil War; Cromwell and the Puritan Ascendency; the attempts to form a firm constitutional government; the relation of English Puritanism to that of Switzerland and New England; the restoration of monarchy; and the final triumph of Parliament in the overthrow of James II.

4. **THE HISTORY OF THE CHRISTIAN CHURCH.**

This course will give a general history of the Christian Church from the days of the Apostles up to the present time. The leading topics considered will be: the pre-Constantine church, including the persecution and the formation of a definite ecclesiastical organization; the effects upon the church of Constantine's conversion; the Nicene Creed and the early heresies; the conversion of the barbarians and its reflex action upon the church; Monasticism; the rise of the Papacy; the Mediæval Church at its height; the rise of heresy—Wyclif, Huss, Savonarola; the reformation—Luther, Zwingli, Calvin; the Catholic Reformation; the religious wars of the sixteenth and seventeenth centuries; the Puritans; and a survey of the history of the leading Protestant denominations. The purpose of the course will be to give a clear conception of the history of the church as a whole, not to deal in detail with any single period.

5. **ECONOMIC HISTORY OF EUROPE.**

The aim of the course will be to give a general account of the rise and development of the leading economic and social institu-

tions of Europe. Some of the subjects considered will be: the manor; the different systems of land holding; serfdom; the merchant and craft guilds; the domestic and factory systems of industry; town life and the Hanseatic League; the rise of commerce and the struggles for world commercial supremacy; and the economic importance of colonies. Especial attention will be paid to English conditions. This course will be of particular assistance to students of economics.

6. UNITED STATES HISTORY. Different subjects for this course may be taken in succeeding years such as: Colonial Possessions of the United States, including a sketch of the history of the Dutch, Spanish and Portuguese colonies, and a comparison of their problems, successes and failures with those of the United States in the Philippines and Porto Rico; the history of the United States from the Missouri Compromise to the outbreak of the Civil war, with especial emphasis upon the years following the compromise of 1850. The students will be expected to present reports upon topics assigned by the instructor; these will form the basis for a critical discussion.

LIBRARY

The Library is under the control of a Library Committee, appointed by the Trustees, of which the President of the University is *ex officio* chairman. The duties of this committee are to advise concerning the arrangement, cataloguing, use of books, and other matters pertaining to the Library not reserved to the Trustees nor otherwise provided for.

LIBRARY COMMITTEE

PRESIDENT G. STANLEY HALL, *Chairman*

PRESIDENT CARROLL D. WRIGHT

PROFESSOR WILLIAM E. STORY, *Secretary*

LIBRARY STAFF

LOUIS N. WILSON, *Librarian*

ASSISTANTS

EDITH M. BAKER, *Senior Assistant*

EDITH M. BURRAGE

LEROY M. HANDY

HELEN J. ELLIOT

MARY D. THURSTON

HELEN E. TUNBRIDGE

The Library building is situated on the corner of Main and Downing streets. The Public Opening of the new building was held January 14th, 1904. A full description of the building and of the Proceedings at the Opening will be found in the *Publications of the Clark University Library* for April, 1904 (Vol. 1, No. 3).

The College Library and study rooms are located in the rooms formerly occupied by the University Library in the Main Building.

The Library contains about 45,000 bound volumes and 1,500 pamphlets, and the reading-room receives over 400 journals.

The books are grouped as follows:

| | | | |
|-----|---|---|-----------------------------------|
| A | WORKS OF GENERAL REF- ERENCE | L | BIOGRAPHY |
| B | JOURNALS | M | ANTHROPOLOGY |
| C | MATHEMATICS | N | EDUCATION |
| C D | MATH.-PHYSICS | O | GENERAL SCIENCE |
| D | PHYSICS | P | HISTORY |
| D E | PHYSICAL CHEMISTRY | Q | LAW |
| E | CHEMISTRY | R | POLITICAL AND SOCIAL SCI- ENCE |
| F | BIOLOGY, ZOOLOGY, BOT- ANY, PHYSIOLOGY, NEU- ROLOGY | S | ENGLISH |
| G | GEOGRAPHY | T | MODERN LANGUAGES |
| H | PATHOLOGY | U | CLASSICS |
| I | PSYCHOLOGY | W | PRACTICAL ARTS |
| J | PHILOSOPHY | X | LIBRARY SCIENCE |
| K | RELIGIOUS PSYCHOLOGY | Y | ART |
| | | Z | MANUSCRIPTS |

Books not included under any of these subjects are grouped as Miscellaneous, and marked according to their case, tier and shelf.

Particular attention is paid to the needs of students engaged in research work. The library already possesses a good collection of complete sets of the best scientific periodicals. It makes liberal purchases for individual needs and supplements these by drawing upon the resources of the older and larger libraries through the inter-library loan system. During the past year 286 volumes were borrowed from, and 117 volumes

lent to, other libraries. The number of books added each year is about four thousand volumes.

The publications of the library, edited by the Librarian, and commenced in October, 1903, are as follows:

VOL. 1

- No. 1. WILSON, LOUIS N.
Bibliography of the Published Writings of
President G. Stanley Hall. Oct. 1903.
- No. 2. WILSON, LOUIS N.
Bibliography of Child Study for the Year 1902.
Jan. 1904.
- No. 3. Proceedings and Addresses at the Public Open-
ing of the Library Building of Clark University,
Thursday, January 14. 1904. Apr. 1904.
- No. 4. WILSON, LOUIS N.
Bibliography of Child Study for the Year 1903.
July 1904.
- No. 5. WILSON, LOUIS N.
Preparing Manuscript for the Press. Jan. 1905.
- No. 6. Founder's Day, Clark University. Apr. 1905.
- No. 7. WILSON, LOUIS N.
Bibliography of Child Study for the Year 1904.
July 1905.
- No. 8. DE PEROTT, JOSEPH
The Probable Source of the Plot of Shake-
speare's Tempest. Oct. 1905.
- No. 9. Proceedings and Addresses at the Public Open-
ing of the Art Department of Clark University.
Dec. 1905.

VOL. 2

- No. 1. List of Books and Pictures in the Clark Memorial Collection. pp. 74+6. July 1906.
- No. 2. WILSON, LOUIS N.
Bibliography of Child Study for the Year 1905.
pp. 24. Oct. 1906.
- No. 3. WILSON, LOUIS N.
A few titles in Child Study. pp. 8. Apr. 1907.
- No. 4. Proceedings at the First Annual Banquet of the New England Association of Alumni of Clark University, and at the Banquet of the Washington, D.C., Alumni Association, 1907. pp. 39.
June 1907.
- No. 5. WILSON, LOUIS N.
Bibliography of Child Study for the Year 1906.
pp. 26. Aug. 1907.

The department of religious psychology, established within the past few years, has grown rapidly and now supports *The American Journal of Religious Psychology and Education*, of which two volumes have been completed and a third volume begun.

The books in the Art Department are accessible on application to the librarian, but, by the terms of the Founder's will, they cannot be taken from the building.

All the privileges of the library are open to all members of the University, and each member has direct access to every book and journal.

The library is open from 8 A. M. to 6 P. M.

Outside the University are found:

The Library of the American Antiquarian Society, organized in 1812, and containing over 120,000 volumes, is accessible to all members of the University.

The Worcester Public Library, containing 600 newspapers and magazines and 165,000 volumes, has, in the past, to some extent supplemented the scientific publications purchased by the University, and all its privileges are accessible without charge.

The Library of the Worcester District Medical Society of about 10,000 volumes, is also free to all members of the University.

LIBRARY RULES

No loud talking is allowed in any part of the Library.

Every book shall be returned at the end of one calendar month from the time at which it was taken out, but may be called in at any time at the discretion of the Librarian.

Current numbers of periodicals shall not be taken out until they have been in the Library ten days.

All dictionaries, cyclopædias, and books of general reference are permanently reserved.

Reserved books and current numbers of periodicals, exempt from circulation, may be taken out after 5.30 P. M., but must be returned before 9 o'clock the next morning, excepting that such books and periodicals may be taken out Saturdays at 12 o'clock M., and may be kept until 9 o'clock the next Monday morning.

Readers must not write or make any mark upon any book, manuscript, map, or other property belonging to the Library.

Any breach of the above Rules will involve suspension of the Library privileges until personally restored by the Librarian. All such cases shall be laid before the Library Committee at their next meeting.

ART DEPARTMENT

In his last will and testament the Founder of the University bequeathed

“the sum of \$100,000, as an endowment fund for the Art Department of said University, and said sum is to be held and kept sacred and intact as a principal not to be used or expended under any conditions; but the income, interest or proceeds thereof shall be used only in putting and keeping said works of art or others given or obtained for said department in good condition and in taking care of them; and then if there is a surplus of the income of said fund left, I will and direct that it be used in the purchase of additional works of art or of such matters as will add to the usefulness and efficiency of said Art Department.”

Under these conditions a large room has been furnished and equipped on the upper floor of the Library Building. Upon the death of Mrs. Clark, those of the Founder's collections that were deemed most suitable for this purpose were arranged and displayed in this room, together with his most valuable books, which, by the conditions of the will, cannot be removed from the building. A complete catalogue of these books and paintings has been published in the PUBLICATIONS OF

THE LIBRARY, Vol. 2, No. 1. A Curator and Custodian of them have been appointed by the Board (see page 95) and all are now accessible to visitors. The Art Department is open daily (except Sundays) from 9 A. M. to 5 P. M.

REGULATIONS

1. All requisitions for apparatus must be made through the Bursar's office upon printed blanks provided for that purpose, and signed by a member of the staff.

2. So far as possible, orders for only the kind and amount of apparatus certain to be used during the year shall be placed; nothing shall be ordered for future years, and apparatus for research shall take precedence over that for teaching and illustration only.

3. Requisitions for repairs, furniture, plumbing and work about the buildings must be made through the Bursar's office in writing and with detail, and when once passed upon, no change involving additional expense can be made in the requisition without the consent of the Finance Committee.

4. No unappropriated rooms and no part of the University grounds shall be used for any purpose, and appropriated rooms shall not be used for other purposes than the stated University work, for which they were intended without previous permission from the office.

5. Unless for special reasons, absence of instructors from their stated exercises or from town for two consecutive week days, in term time, should be announced at the office, and for longer absence permission should be obtained beforehand.

6. The Trustees desire that no Instructor, Docent, or Fellow shall enter upon other engagements outside

his proper work in the University of a kind or amount likely to lessen his full efficiency for science within the University.

7. Appropriations shall hereafter cover all apparatus and supplies of whatever nature for laboratories, for demonstration or illustration; all metal and carpenter work connected with the scientific activity of each department; and every form of special service. Appropriations, however, shall not hereafter cover books or journals, which shall be submitted to the Library Committee.

8. The several appropriations made to individual instructors and others shall be the full and fixed limit of the liability of the University, to be on no account transcended, and for every excess over the appropriations, from whatever cause, the instructor making the order shall be personally responsible.

9. No order for any purpose shall be paid by the University, whether on appropriations or for general supplies, that has not passed through the Bursar's office.

10. The President, Professors, Assistant Professors and regular Instructors authorized by the Board to do graduate work, together with the Librarian, shall constitute the Faculty of the University. Its meetings shall be called and presided over by its President, or, in his absence, by a Professor whom he shall designate. The Faculty shall elect a Secretary and its records shall always be accessible to the Trustees. Its jurisdiction shall include all matters pertaining to the instruction, conduct and discipline of students, and such other duties as may be prescribed by the Trustees.

11. The President of the University shall make, at

the October meeting, an annual report on the condition of the departments and their work during the year and shall have authority to require and receive from all instructors and Officers of the University and Library such reports as he may deem necessary. A copy of these reports, including that of the Library, shall be deposited with the Mayor of the City.

12. The University Faculty shall have the oversight of all graduate work and shall recommend for the Master's, Doctor's and all other graduate degrees upon such terms, conditions, and forms as it may determine, and exercise such other functions and responsibilities as are not expressly assigned to the Trustees or to the Collegiate Department.

13. The Custodian of the Art Collection shall have general oversight over its room in the Library Building and its contents, together with their care and use, under the direction and control of the Curator. The Curator shall from time to time submit to the Trustees his recommendations for the purchase of additional works of art from the income of the Art Fund, based on and together with the opinions of experts as to their value and desirability. All such purchases shall be approved by the Board of Trustees, or by such a committee of their members as they shall appoint for that purpose.

14. The President of the University shall make an annual report to the Trustees of the action of the Library Committee, of which he is Chairman, and this report, if approved, shall be filed and preserved.

DEGREES CONFERRED

On June 20, 1907, the University conferred degrees upon the following persons:

MASTER OF ARTS

CHARLES WALTER BACON

Dissertation: A study of the determination of carbon by combustion.

FRANCIS MARSH BALDWIN

Dissertation: Daily life of the earthworm.

JOHANNES BROENE

Dissertation: The early philosophy of Friedrich Nietzsche.

CHARLES ELBERT DISNEY

Dissertation: Microscopic structure of insect galls.

EDITH MONTGOMERY DIXON

Dissertation: Problem of the cat in relation to bird life.

LOUISE ELLISON

Dissertation: The psychology of definition as illustrated in children's definitions of abstract terms. Abstract in American Journal of Psychology, April, 1908.

CARLETON BELL NICKERSON

Dissertation: A study of the solubility and reduction products of potassium chlorplatinatate.

CAROLINE AMELIA OSBORNE

Dissertation: The cat: A neglected factor in sanitary science. Pedagogical Seminary, December, 1907, Vol. 14, pp. 439-459.

TIMOTHY JOSEPH STEVENSON

Dissertation: The time relations of binocular phenomena. American Journal of Psychology, January, 1908, Vol. 19, pp. 130-137.

JUN WATANABE

Dissertation: The relation of trusts to labor unions.

DOCTOR OF PHILOSOPHY

LEWIS FLINT ANDERSON

Dissertation: The development of the non-professional school in Europe before the Renaissance. Pedagogical Seminary, March and June, 1907, Vol. 14, pp. 1-38, 223-282.

HORACE LESLIE BRITTAIN

Dissertation: A study in imagination. Pedagogical Seminary, June, 1907, Vol. 14, pp. 137-207.

WILLIAM FRANKLIN COPELAND

Dissertation: Periodicity in spirogyra.

ORIS POLK DELLINGER

Dissertation: Comparative study of cilia as a key to the structure of contractile protoplasm.

DAVID SPENCE HILL

Dissertation: The education and problems of the Protestant ministry in the United States.

TADASU MISAWA

Dissertation: A sketch of the history of the modern philosophy of education.

GEORGE EDWIN STEBBINS

Dissertation: Sound distortion by the telephone transmitter and receiver.

WILLIAM EDWARD STORY, JR.

Dissertation: An investigation on the Poulsen arc in wireless telegraphy.

The following gentlemen also have taken the examination for the doctor's degree, but have not yet completed all the formal requirements.

EUGENE W. BOHANNON

A. CASWELL ELLIS

PUBLICATIONS RELATING TO THE UNIVERSITY

A Register and Official Announcement is issued each year in February or March.

In the years 1890, 1891, 1893, and 1902, the annual Report of the President to the Board of Trustees was printed.

A Summer School was held for nine years ending in 1903, and in such years a Summer School Programme was issued.

In July, 1899, the University observed its tenth anniversary, and published the following volume:

Clark University, 1889-1899. Decennial Celebration. 8 x 11 in., pp. 566. Published for the University. Price, \$5.00. Contains the lectures delivered by Professors Picard, Boltzmann, Cajal, Mosso and Forel at the Decennial Celebration, July, 1899; also reports by the heads of departments on their aims and ideals, with a list of past and present members of the University and the titles of their published papers.

JOURNALS CONNECTED UNOFFICIALLY WITH THE DEPARTMENTS

THE AMERICAN JOURNAL OF PSYCHOLOGY. This journal was commenced in November, 1887, and is now edited by G. Stanley Hall, E. C. Sanford, and E. B. Titchener (Cornell University) with the assistance of an international board of co-operators. Each volume contains four numbers—issued in January, April, July

and October. Besides original articles, a considerable portion of its space is devoted to careful digests of the important literature in its field. Price, \$5 per volume; single numbers, \$1.50. Florence Chandler, Publisher, Worcester, Mass.

THE PEDAGOGICAL SEMINARY. This journal was begun in January, 1891, and is edited by the President of the University. It is an international record of educational literature, institutions and progress, and is devoted solely to the highest interest of education in all grades, with digests of important literature of all countries. It is the organ of the Educational Department of the University. Each volume contains four numbers—issued in March, June, September and December. Price, \$5 per volume; single numbers, \$1.50. Florence Chandler, Publisher, Worcester, Mass.

THE AMERICAN JOURNAL OF RELIGIOUS PSYCHOLOGY AND EDUCATION. This journal was begun in May, 1904, and three numbers constitute a volume. It aims to give an account of all the more important books and periodicals in its field, which includes religious education, and publishes original articles. Each number contains about 100 pages. Price, \$3.50 per volume, \$1.50 per number. Louis N. Wilson, Publisher, Worcester, Mass.

UNIVERSITY COLORS
EMERALD GREEN AND WHITE

To be worn in the hood as a green chevron
on a white field.

